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ABSTRACT

The Survey of Special Test Administrations was administered to people with disabilities concerning their responses to special testing accommodations, both for college testing and for the Scholastic Aptitude Test (SAT) and Graduate Record Examinations (GRE). The questionnaires were developed to evaluate testing accommodations for disabled people and to obtain information on the kinds of disabilities within categories of handicap. Although there are limitations due to a poor response rate and small subgroups of respondents, the study reported high overall satisfaction with special testing accommodations. The complaints of a small minority of respondents involved the test itself and the conditions of testing, including time and space considerations. In addition, the accommodations made for the SAT or GRE were compared with accommodations provided for other college tests. The standardized tests were offered in special versions and with extra time more frequently than were college tests. Four disability groups--hearing impaired, learning disabled, physically handicapped, and visually impaired--were found to be worthy of additional study. Age of onset of the disability was an interesting factor. Distinguishing categories were found for all disability groups except learning disabled. The GRE and SAT questionnaires and data tables are appended. (Author/GDC)

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A SURVEY OF HANDICAPPED STUDENTS TAKING SPECIAL TEST ADMINISTRATIONS OF THE SAT AND GRE

Marjorie Ragosta
and
Bruce A. Kaplan

February 1986

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Report No. 5
Studies of Admissions Testing and Handicapped People
A Project Sponsored by

College Entrance Examination Board
Educational Testing Service
Graduate Record Examinations Board

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Studies of Admissions Testing and Handicapped People

Most admissions testing programs have long made accommodations for handicapped examinees, though practices have varied across programs and limited research has been undertaken to evaluate such test modifications. Regulations under Section 504 of the Rehabilitation Act of 1973 impose new requirements on institutional users, and indirectly on admissions test sponsors and developers, in order to protect the rights of handicapped persons. The Regulations have not been strictly enforced since many have argued that they conflict with present technical capabilities of test developers. In 1982, a Panel appointed by the National Research Council released a detailed report and recommendations calling for research on the validity and comparability of scores for handicapped persons.

Due to a shared concern for these issues, College Board, Educational Testing Service, and Graduate Record Examinations Board initiated a series of studies in June 1983. The primary objectives are:

To develop an improved base of information concerning the testing of handicapped populations.

To evaluate and improve wherever possible the accuracy of assessment for handicapped persons, especially test scaling and predictive validity.

To evaluate and enhance wherever possible the fairness and comparability of tests for handicapped and nonhandicapped examinees.

This is one of a series of reports on the project, which will continue through 1986. Opinions expressed are those of the authors. See Appendix for an annotated bibliography of earlier reports of the series.

RR-86-5

A Survey of Handicapped Students Taking Special Test Administrations of the SAT and GRE

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Princeton, New Jersey 08540

February, 1986

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Our greatest thanks to those hundreds of students whose responses to our questionnaire allowed this study to be done.

Sincere thanks to all of you.

Abstract

This study examined the responses of disabled people to questionnaires on special testing accommodations both for college testing and for the Scholastic Aptitude Test (SAT) and the Graduate Record Examinations (GRE). The questionnaires were developed to help evaluate testing accommodations for disabled people and to obtain additional information on the severity or kinds of disabilities within categories of handicap.

After discussing the limitations of the study due to a poor response rate and small subgroups of respondents, the study reported on the high level of overall satisfaction with special testing accommodations and covered extensively the complaints of a small minority. These complaints involved the test itself and the conditions of testing, including time and space considerations.

A second major section of the report dealt with a comparison of accommodations made for the SAT or GRE with accommodations provided for college testing. The standardized tests were offered in special versions and with extra time more frequently than were college tests.

A tentative look within the four disability groups of hearing impaired, learning disabled, physically handicapped, and visually impaired test takers found subgroups worthy of more extensive study.

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Introduction

This study was conducted as part of a joint project, "Studies of Admissions Testing and Handicapped People," funded by the College Board (CB), Educational Testing Service (ETS), and the Graduate Record Examinations (GRE) Board in response to recommendations by the National Academy of Science's Panel on Testing of Handicapped People (Sherman & Robinson, 1982). For this study, survey instruments were sent to handicapped college candidates and graduate school candidates who had taken special test administrations of the Scholastic Aptitude Test (SAT) or GRE. The purpose of the survey was two-fold: to obtain information which could help evaluate the testing accommodations provided to disabled students and to identify possible subgroups or levels of disabilities within identified handicapped groups. The report will discuss the survey and its respondents, evaluate special test administrations and take a tentative look within disability groupings.

The Survey and Its Respondents

The survey questionnaire was developed to obtain information on students' disabilities and on conditions of testing both for admissions to college or graduate school and for final examinations. Two versions of the survey were developed: one for SAT test takers and one for GRE test takers. Copies of the survey instruments are included in Appendix A.

The SAT questionnaire was sent to all disabled candidates using special test administrations of the SAT during the 1982-83 school year, with one exception. Because the majority of special administrations were for learning-disabled (LD) students using the regular-type version of the SAT with extra time, a random sample of almost 500 students was selected from that category for participation in the study. All remaining LD students who took large-type or cassette versions of the test as well as all remaining

students with hearing, physical or visual disabilities were included in the study. The GRE questionnaire was sent to all disabled candidates who took special administrations of the GRE in the 1983-84 school year. Surprisingly, no individuals who classified themselves as hearing impaired took special test administrations of the GRE.

Only one-third of the SAT contacts (856 of 2555) returned their questionnaires, while almost seventy-two percent of GRE contacts (236 of 329) did so. The difference may be attributable in part to the length of time between test taking and receiving the questionnaire. Addresses used for the SAT survey were 8-20 months old and were the home or school addresses at the time of the SAT special test administration. The GRE addresses, on the other hand were only a few weeks or months old when they were used to contact disabled GRE test takers.

Because the return rate was low, it is important to compare the survey respondents with the total group contacted, to see in what ways the two groups differ. Table 1 presents those data for the SAT; Table 2 presents them for the GRE.

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Insert Tables 1 and 2 about here

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From the data in Table 1, we can see that although the overall response rate on the SAT survey was one-third, 40 percent of hearing impaired, physically handicapped, and visually impaired individuals responded while only 25 percent of LD students returned the questionnaire. In general, the 2,555 disabled SAT test takers contacted for this study were more frequently

male and earned lower SAT scores than the average for all college-bound seniors (College Entrance Examination Board, 1984). Compared to those contacted, the respondents were more often female and on the average earned higher SAT scores--18 points on verbal and 23 points on Mathematical subtests. Except for the Verbal score of hearing-impaired respondents, the pattern of fewer male and higher scoring respondents was consistent across handicapped groupings. Even though respondents were a higher scoring subset of those contacted, respondents' SAT scores were still considerably below--29 points on Verbal, 26 points on Mathematical--the scores of college-bound seniors. Interpretation of the results of the SAT survey must be constrained by its poor response rate and its overrepresentation by higher scoring students.

Disabled GRE contacts earned Verbal and Analytical scores 3 to 5 points higher than the national norms, although their Quantitative scores were 63 points lower over all. Respondents showed the same pattern described earlier, with fewer males and higher scores than the total group contacted, although the effect was smaller. Over all, respondents had scores which were 10 points higher on verbal, 6 points higher on quantitative, and 13 points higher on analytical subscores than the group originally contacted. Respondents' scores were 15 or 16 points higher on the GRE's verbal and analytical subtests, and 57 points lower on the quantitative subtest, than the mean scores for all GRE test takers in 1983-84.

Compared to the SAT respondents, GRE respondents performed better on the verbal subtest and poorer on the mathematical (quantitative) subtest relative to the general population of test takers. The high verbal scores for the GRE test takers are surprising in light of the low verbal scores on the SAT for a similar group of students. The performance of LD students, especially, is

inconsistent. In the SAT survey, LD contacts were 66 points below the national average on the verbal subtest, and LD students returning the SAT questionnaire were 45 points below. In the GRE data, LD contacts and those returning the questionnaire were 22 or 23 points above national norms for the verbal subtest. Similar to reports on other studies (Bennett, Ragosta, & Stricker, 1984; Bennett, Rock, & Kaplan, 1985; Ragosta & Nemceff, 1982), LD respondents to the SAT survey scored well below visually or physically handicapped students. In the GRE data, LD students scored higher. Either there are differential attrition rates operating from college to graduate school or the LD individuals seeking graduate education are a very different sample from LD high school students seeking a college education.

In order to understand more about respondents to the SAT and GRE surveys, in the remainder of this section we will discuss the classification of disabilities, the perceived severity of the disability, and the age of onset of the disability.

Disability Classification

Data from Tables 1 and 2 were based on the classification of disabilities at the time of testing. Both the student and the test administrator categorized the student's disability at that time. The questionnaire used in this study again asked the student to classify his or her disability and to define it more specifically. With separate classifications made at two different times, how well do the classifications agree? Those data are presented in Table 3.

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Insert Table 3 about here

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The underlined numbers on the diagonal indicate that most disabled test takers responded to the questionnaire in agreement with the original classification. For the SAT data, almost 97 percent (119 of 123) of hearing-impaired candidates, 96 percent of LD students, 92 percent of those with physical disabilities, and 86 percent of test takers with visual impairments classified their disabilities alike on both occasions. For the GRE data, 92 percent of LD test takers, 93 percent of physically handicapped individuals and 94 percent of those with visual disabilities classified their disabilities alike.

The disagreements occurred in part because the wording in the questionnaire encouraged respondents to check all classifications that were relevant. The 857 respondents to the classification question checked 947 classifications, thus indicating some multiple disabilities. Multiple disabilities may result from a variety of causes, especially those involving injury to the central nervous system of a developing fetus. Some respondents, for example, reported both a visual and a hearing disability due to rubella, for example, or cerebral palsy together with a visual disability.

Additional disagreements resulted because of problems of definition. In the SAT data, twenty-one individuals categorized themselves on the questionnaire as visually impaired, or both visually and hearing impaired, but further described their disability as "visual perceptual problems," "visual and auditory memory," "audio-visual problems," or "residual dyslexia." In

all 21 cases the individuals had described themselves at the time of testing, and were described by the test proctors also, as having a learning disability. For those 21 cases observed as the questionnaires were being prepared for keypunching, the visual (or visual plus hearing) categorizations were deleted and the LD category checked. Those cases appear in Table 3 as agreements although originally they were not. Also note that among candidates who originally described themselves as having a visual disability, 46 (15 percent) categorized themselves as learning disabled in the questionnaire.

It is quite likely that confusion in categorizing perceptual problems as visual is not confined to this study alone. Problems surrounding the definition of visual disability have been noted in earlier studies as well (Astin, Hermon R., & Richardson, 1982; Bennett and Ragosta, 1984; Kirchner & Simon, 1984). One major problem for defining visual disability in the past has been failure to exclude from the category those individuals whose vision problems may be corrected by glasses.

In a recent study of handicapped students using the High School and Beyond data base (Stocking, 1984), of 418 sophomores who identified themselves as having a visual handicap (not corrected by glasses), only 33 reported that condition again as seniors. Similarly, of 483 sophomores with specific learning disabilities as sophomores, only 126 repeated that classification as seniors. In the current study there is much more consistency in the classification of disabilities across time. The consistency may be due in part to the severity of the disability which required special testing accommodations, in part to the requirement for affirmation of the disability by the SAT test administrator, and in part to

the fact that the students in this study had permanent rather than temporary disabilities.

Perceived Severity of the Disability

On the SAT and GRE survey questionnaires students were asked how their disabilities affected their academic performance. Responses for both groups are given in Figure 1.

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Insert Figure 1 about here

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Over all, 48 percent of SAT respondents reported their disability had little or no effect on their academic performance. Only 13 percent felt their disability had a severe or very severe effect. Across the disability groups the effects were more often perceived as severe by students with hearing or learning disabilities than by students with visual or physical disabilities. A similar pattern was found in the SAT data presented in Table 1, where mean SAT scores of physically or visually handicapped students were higher than those of hearing-impaired or learning-disabled students.

More than half of GRE respondents reported their disability had little or no effect on their academic performance. Visually and physically handicapped test takers were more likely to report little or no effect (60-61 percent) than were LD respondents. Only 28 percent of LD respondents reported little or no effect while 59 percent reported a moderate effect and 13 percent reported a severe to very severe effect. Despite reporting more

severe educational effects due to their disability, LD respondents reported higher GRE scores than visually or physically handicapped respondents.

The patterns of response from the SAT and GRE surveys were similar, with LD respondents in both cases reporting fewer mild educational effects and a greater number of moderate and severe effects than respondents in other categories.

Age at Initial Diagnosis of Disability

Interesting patterns are found in the responses of handicapped students to the question about age at the initial diagnosis of their disabilities. Those data are reported in Figure 2.

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Insert Figure 2 about here

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For the SAT data, more than half of respondents with hearing disabilities were diagnosed at birth, and 88 percent were diagnosed before entering school. In contrast, only 12 percent of students with learning disabilities had been diagnosed before entering school, although 59% percent were identified as LD in elementary school. The diagnosis of physical disabilities occurs across the age range with peaks at birth and in high school. Visual disabilities appear to be diagnosed early, with 37% of respondents being diagnosed at birth. The data appear reasonable. Sensory impairments are discovered early. Learning disabilities are discovered in the context of school learning — primarily in elementary school — because they are defined that way. The rather flat distribution for physically

handicapped respondents reflects the many different kinds of disability included in the category. Cerebral-palsied respondents, for example, reported birth as the age of onset, while paraplegic and quadriplegic respondents tended to report onset from accidents during high school.

One is struck, looking at the GRE data, by the large percentages of respondents whose diagnosed onset of disability occurred after high school. Fifty percent of LD respondents report their initial diagnosis occurred after leaving high school. Despite the small number of LD respondents, there appears to be a bimodal distribution of those diagnosed early--primarily in elementary school--and those diagnosed late--primarily in college. That might help to explain the inconsistency in LD students' standardized test performance on the SAT and GRE. Additionally, almost half of physically handicapped GRE respondents and more than one-quarter of visually handicapped GRE respondents were diagnosed as disabled after high school. Disabled applicants to graduate schools appear in these data to be--at least in part--different from disabled applicants to college. Thirty eight percent of GRE respondents either had recent disabilities or were more recently diagnosed.

Discussion

Because of the relatively poor response rate to the SAT survey and the relatively small number of respondents to the GRE survey, it is important to identify the characteristics of respondents in the study. Findings from this study can be generalized only to similar samples of the handicapped population.

The sample of SAT respondents in the current survey had a smaller percentage of males and a larger percentage of higher scoring students than

the sample contacted initially. Similar to other studies in this series (Bennett, Ragosta, & Stricker, 1984; Bennett, Rock, & Kaplan, 1985), data from the SAT sample in this study show the test performance of visually and physically handicapped respondents generally better than that for LD respondents, with hearing impaired respondents earning the lowest scores. Respondents with sensory disabilities—i.e., visual or hearing impairments—tended to be diagnosed at birth or shortly afterward, while the majority of LD respondents were diagnosed in elementary school. Physically handicapped respondents were diagnosed at all ages, with about one-quarter at birth and another quarter in high school.

The GRE sample contained many respondents with relatively new or newly diagnosed disabilities. Half of the physically handicapped and learning disabled respondents, and more than one-quarter of visually handicapped respondents, reported their disabilities were not diagnosed until after they had left high school. There were no GRE respondents who had classified themselves as hearing impaired at the time of the special test administration.

Overall, both SAT and GRE respondents tended to report their disabilities had little or no effect on their academic performance, with fewer reporting a moderate effect, and very few reporting a severe effect. Only LD respondents broke that pattern. Both SAT and GRE respondents with learning disabilities tended to report a moderate effect more often than a slight effect. Hearing-impaired and LD respondents reported severe effects more often than did visually or physically handicapped respondents--a pattern reflected in their test scores.

Bearing in mind the constraints of the study--due to a relatively poor response rate which overemphasizes higher-scoring disabled people--we turn now to a discussion of special testing accommodations.

Special Testing Accommodations

The survey questionnaire used in this study asked recipients for feedback on taking the SAT or GRE and for information on special testing accommodations in college. In this section of the report we will discuss awareness of special test administrations for the SAT and GRE, satisfaction with testing accommodations, test questions which posed special problems, and, finally, a comparison of accommodations made for college testing and admissions testing.

Awareness of Special Testing Accommodations

Respondents indicated whether or not they had been aware of special accommodations for handicapped students at the time they first took the SAT or GRE. A follow-up question asked from what source(s) information was obtained. Those data are summarized in Table 4.

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Insert Table 4 about here

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As might have been expected, more GRE respondents were initially aware of special testing accommodations for disabled people than were the high school students taking the SAT. Whereas 68 percent of SAT respondents were unaware, only 19 percent of GRE respondents were unaware. Although all of

the respondents to this questionnaire had taken the SAT under special testing arrangements, some handicapped students who have taken a standard SAT administration have reported not knowing that special accommodations exist (Ragosta, 1980). There is continuing need for efforts to inform handicapped students and their high school counselors of the availability of special accommodations for taking the SAT. The current data can give us no estimate of the percentage of disabled students who did not find out about special accommodations and who took regular test administrations or were afraid to take the tests because of their disabilities. The current surveys can, however, give us an estimate of the sources of information available to disabled test takers.

The source of knowledge about special testing accommodations for the SAT is relatively consistent across all disability groups, with 84-93 percent of respondents being made aware of special testing by either high school counselors or special education teachers. For 16 percent of the visually impaired, an agency for the handicapped provided information, a much larger percentage than for any other group. The third largest source of information about special test administrations were "others," including parents, neighbors, friends, relatives, medical professionals, and school administrators.

The source of knowledge about special accommodations for the GRE looks quite different. Where only 5 percent of high school students reported learning about special test accommodations through ETS, about two-thirds of GRE respondents reported their information came from the GRE Information Bulletin. LD students were less likely than others to use that source, however, and were more likely than physically or visually impaired respondents to learn from "other" sources--e.g., parents.

Satisfaction with Testing Accommodations

Respondents were asked to evaluate whether their special test administration was satisfactory and, if not, why not. The data are presented in Table 5.

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Insert Table 5 about here

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SAT Survey. Over all, 94 percent of respondents reported that their special test arrangements were satisfactory. That satisfaction ranged from a high of 97 percent of physically disabled students to a low of 88 percent of students with a hearing disability.

Although respondents were overwhelmingly positive, we will concentrate in this section on trying to understand why respondents were dissatisfied. Only by understanding the problems encountered can we be in the position to improve services to disabled students. Some of the sources of dissatisfaction were: (1) the test itself, (2) time and space considerations, (3) problems with test administration, and (4) other difficulties.

(1) The test itself was reported as hard to comprehend, too advanced, having vocabulary that was too difficult, unfair to the hearing impaired, and different from the tests taken by nonhandicapped people. Two respondents mentioned not being able to see their answers afterwards as other test-takers could.

(2) Some respondents reported they would have liked a different room, or a less noisy or busy room, in which to take the test. Other handicapped

students reported that the test should not have been timed, that the test was given before the student was ready, that the students didn't have enough time, and that extra time was needed.

(3) Other conditions with which handicapped respondents were unhappy included not having a reader, not having an interpreter, having a reader who was impatient, or having a reader who would not reread questions for the test taker. In other cases, respondents reported some test booklets were incomplete, a large block answer sheet was missing, or the braille graphs were incorrect.

(4) A fourth group of problems related to respondents' feelings in the testing situation. Students reported wanting to take the SAT with others despite the refusal of the school district, and feeling it was unfair to be treated differently.

GRE Survey. Over all, 86 percent of GRE respondents were satisfied with the special testing accommodations provided them, and that level of satisfaction was almost uniform across disability groups.

GRE respondents reported the same kinds of difficulty in the same categories described by SAT respondents. The following comments were recorded:

(1) The recorded (cassette) math section was described as inadequate. Braille, cassette, and print versions of the test did not always match. For some of the math questions there was no braille diagram to describe the concept. Several respondents had difficulty using the separate answer sheets.

(2) The largest number of complaints had to do with the need for extra time; it was reported by at least 13 respondents. One braille test taker reported, "It is difficult to read over four pages of braille and answer four

questions at the end. Braille does not permit skimming." Additional respondents reported fatigue or pain as the result of stress over the long period of testing. One respondent suggested, "half the test one day, the other half the next day. Fatigue affected my score." Some respondents were concerned about the space provided for them. A small hand desk was inconvenient for a test taker with a large-print test and large-block answer sheet. Another respondent needed space to write while standing. A third had requested a special desk but had not been able to get one. Finally, some respondents were unhappy with their location. Too noisy, distracting, too hot, too cold, and too many interruptions were the comments received. One student wrote, "You can't concentrate when placed in a busy hallway at the entrance to the building".

(3) There were frequent complaints about readers: The reader was hard to follow, not literate, did not pace the test, was no good, was unsatisfactory, read too fast, would not reread questions, kept talking to the test taker or made gutteral sounds which were distracting. Two respondents reported receiving the wrong test or incorrect braille graphs. Other complaints about test administration included not enough resting time, not enough lighting, and the test location being too far from handicapped parking.

(4) Several respondents felt dissatisfied because despite special accommodations they still received low scores. Another respondent wanted to test under standard conditions but was not allowed. On respondent wrote, "they sat me in the front of the room in my wheel chair where over 200 students could see me. I felt like a performer on stage."

Discussion. Criticisms by both SAT and GRE respondents could be classified into four categories: (1) the test itself, (2) time and space

considerations, (3) problems with test administration, and (4) other categories.

(1) Dissatisfaction arising from the tests themselves--especially complaints about the difficulty level--is inevitable when taking tests like the SAT and GRE. Standardized tests are likely to be difficult for some nonhandicapped people as well as for handicapped people. However, one disability group -- hearing-impaired students -- has been shown to perform well below the general population on the SAT, especially on the verbal portion. That consistent finding is likely the result of the well-documented English language deficiencies of deaf people. The college performance of hearing-impaired students, however, appears to be better, perhaps in part because of college support services including sign-language interpreters. It may be possible that testing accommodations geared to the special needs of some deaf students could help compensate for English-language deficiencies and bring their SAT scores more in line with their college performance. More research is needed on this issue.

That the tests are different from those taken by nonhandicapped people is partly true. The forms of SAT tests used for special test administrations have a history of use for the general population. However, they are retired from that use for test security reasons when they are selected for use in special administrations of the SAT.

For some national administrations of the SAT and GRE there is a test disclosure service by which test takers can pay for a copy of the test, a copy of the test taker's answer sheet, and a scoring key. The disclosure service is available only on certain national test-administration dates because once the test has been made public, it cannot be used again. Because SAT special test administrations are offered on any day throughout most of

the year, a test-disclosure policy for those administrations would result in the need to retire thousands of tests each year. Clearly, that is not possible. In the 1985-86 school year, the College Board and ETS will initiate a new service for learning-disabled college candidates taking the SAT. For those LD students requiring only extra time (up to one and a half hours), special test administrations will be offered on national test dates. Participants who elect this special testing option will be taking the identical tests offered to nonhandicapped people. They will be able to take advantage of the question-and-answer service whenever that service is available to other candidates.

An alternate strategy for monitoring one's own test performance is the use of actual released forms of the tests for preparation prior to taking either the SAT or GRE. Ten SAT's, (College Board, 1983), contains 10 actual tests; Practicing to Take the GRE General Test (Second Edition: ETS, 1984), contains 3 tests used in recent years. There is a small cost for each of the publications.

(2) Time and space considerations are relatively frequent sources of dissatisfaction with special test administrations. Unfortunately there are no data from standard test administrations for comparison.

The question of how much time to allow in special test administrations is a serious one on which people disagree. On the one hand, unlimited time would allow disabled test takers an opportunity to complete the test--an opportunity not given to people in standard testing situations. It is quite likely that many nonhandicapped people would also complain of not having enough time. On the other hand, time limits--wherever they were set--would continue to penalize the most severely handicapped test-takers.

Test space is a much less controversial issue. Testing accommodations should be comfortable, the noise and distraction level should be minimal, and space enough for large-type or braille testing materials should be available. The 1984-85 Guide to Administering ETS Tests (ETS, 1984) deals with just such issues. All test administrators -- indeed all of us involved in testing programs -- should become more sensitive to the needs of disabled individuals in the testing situation. Increased monitoring and subsequent improvement of special test administrations could result from a process by which disabled students could inform ETS of the adequacy of their testing accommodations. One method might be the use of an evaluation form sent to the disabled student along with other testing information. A second method might be the establishment of a hot line for disabled students encountering problems. All testing programs should establish some means for evaluating the adequacy of their special test administrations.

(3) Additional test administration problems mentioned by respondents include complaints about readers and an occasional complaint about receiving incorrect testing materials. On the latter point, we know that errors do occur. They occur very, very infrequently, but mistakes happen. Every effort will be made to see they happen even less frequently in the future.

Complaints about readers--even though those complaints were infrequent relative to the total use of readers--have led to discussions on the need for a manual of guidelines for readers. Although the manual has not yet been started, the chances of its eventual production are good.

(4) Despite the foregoing discussion of problems with the SAT and GRE special test administrations, the overwhelming satisfaction of most students was gratifying. Two comments from the questionnaires deserve special mention:

> I was admitted, early decision, to a highly competitive 4-year college. My math SAT score was, I believe, an important factor in that decision. Thank you for giving me the opportunity to achieve!
>
> I first took the SATs like everyone else. My score was significantly low. Taking the disability option - extra time, separate room - made a large difference. I was thankful I found out about (special testing)...However, I hope all colleges look at the advantage of the student other than SAT scores. If I hadn't known about the special option, things might have been different.

Not all disabled students were as satisfied as those quoted above, but many were. With increased sensitivity to and experience with the educational and testing needs of disabled students, and with additional knowledge from research, there is every reason to hope that we will do an even better job of satisfying handicapped test takers in the future.

Difficult Test Questions

Recipients of the survey questionnaires were asked what kinds of SAT & GRE test questions were most difficult because of their disabilities. Those data are presented in Table 6.

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Insert Table 6 about here

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Overall, more than 25 percent of SAT and GRE respondents reported that no test questions were more difficult because of their disabilities. One physically handicapped individual explained his answer this way:

> Of course there were areas of the SAT that were harder for me, just as they are for others, because they are not my best subjects. However, no particular difficulty with questions was related to my disability.

When difficult test items were identified, the most difficult items for one group might be the least difficult for another. For example, 59 percent of SAT respondents with hearing disabilities reported most difficulty with vocabulary items, while only 8 or 9 percent of physically handicapped or visually impaired respondents agreed. Overall, the largest percentage of SAT and GRE respondents (43 and 44 percent) agreed that questions with a lot of reading were most difficult. However only 13-18 percent of physically handicapped respondents found lots of reading created problems. Because of the variability across groups of respondents, the remainder of this section will be devoted to discussing difficulties by disability groupings.

Hearing-impaired respondents. Hearing-impaired respondents reported vocabulary (59 percent), reading comprehension (51 percent), and lots of reading (40 percent) created problems on the SAT. Perhaps the language problems are serious enough to deter hearing-impaired people from graduate education. There were no people taking special test administrations of the GRE in 1983-84 who categorized themselves as hearing impaired.

Learning-disabled respondents. Lots of reading (57 percent), reading comprehension (54 percent) and vocabulary (44 percent) created difficulty according to LD respondents at the SAT level. Lots of reading was also a problem for 66 percent at the GRE level. Verbal, analytical, and quantitative questions on the GRE were perceived as almost equally difficult with about one-third of respondents checking each of these categories.

Physically handicapped respondents. Almost two-thirds of SAT and GRE respondents with physical disabilities reported no questions were more difficult because of their handicaps. Respondents at both levels reported mathematics or quantitative ability questions more difficult than other types of questions.

Visually impaired respondents. At the SAT level, lots of reading was perceived as difficult by 43 percent of visually impaired respondents and reading comprehension by 28 percent. In addition, 24 percent reported difficulty with questions containing graphic material. At the GRE level, graphic material was a problem for 48 percent and lots of reading for 44 percent.

The primary difficulties reported by disabled test takers are reasonable in light of their disabilities. Language-development problems encountered by hearing-impaired people could account for the difficulty with vocabulary on the SAT. Problems with reading--a characteristic of most learning disabled individuals--may be responsible for their perception that lots of reading causes most difficulty on SAT and GRE tests. Lots of reading and graphic material create problems for people with visual impairments. Data on difficulties with specific kinds of test questions may provide guidance for the interpretation of the results of item-analysis studies.

A Comparison of Accommodations for Admission and College Testing

In order to identify the respondents whose data were used in this comparison study, we report on the percentages of respondents in college in Table 7 and present their self-reported college grade point averages in Figure 3.

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Insert Table 7 and Figure 3 about here

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Only 472 of the more than 800 SAT respondents--57 percent--reported attending college the year after they had taken their special test administrations. A larger proportion of GRE respondents--74 percent--attended college the year they took their special test administrations of the GRE.

As might be expected, SAT respondents who reported freshman grades were a less able group than those applying to graduate school. Overall, the modal response from the SAT survey indicated students earning grade point averages from 2.5 to 2.9, while the GRE survey's modal response was in the highest category--above 3.5. Across handicapped groups there were differences. The SAT survey showed hearing-impaired students reporting grades similar to those for the overall group, learning-disabled respondents reporting lower grades, and physically handicapped and visually impaired respondents earning higher grades. The GRE respondents showed a similar pattern--a pattern which is mirrored in respondents' perceived effect of their disabilities on their academic performance (Figure 1). Data on special testing conditions will be discussed separately for the SAT and GRE respondents.

SAT respondents. A comparison of special testing arrangements made for the SAT and for college testing is presented in Table 8. Because respondents who went to college were only 54 percent of total SAT respondents, data for both the total group and the college attendees are presented. There appear to be no major differences in the types of SAT accommodations offered to the subset of the total group.

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Insert Table 8 about here

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Comparing the overall accommodations of the college-attending respondents on SAT tests and college tests, one notes several differences. College tests are less frequently offered in special versions such as braille, cassette, or large type. For example, 31 percent of SAT special administrations were given with large-type tests, while only 8 percent of respondents reported ever using a large-type test in college. On the other hand, more use of a regular-type test is reported for college testing. Whereas 58 percent of respondents had used a regular-type version of the SAT, 81 percent had used a regular-type college test. Ten percent of college-attending respondents reported sometimes taking a different final exam.

An overall pattern which generally held up across disability categories can be observed in the use of special testing conditions. Larger percentages of respondents reported having extra time and a separate room for SAT testing (84 and 72 percent) than for college testing (51 and 34 percent). Conversely, larger percentages of respondents reported using an amanuensis, a reader, an interpreter, or special equipment for college testing than for SAT testing. More specific information will be discussed within the four disability groupings.

(1) Hearing-impaired students. Almost all hearing-impaired students took the regular-type version of the SAT, many with extra time or a separate room. About one-fourth had an interpreter for instructions. In college, about 88 percent reported using regular-type tests, but 29 percent reported sometimes or often taking a different examination.

(2) Learning-disabled students. Fewer LD respondents reported using cassette or large type tests in college (7 and 5 percent) than for SAT testing (32 and 19 percent). A larger percentage reported using regular-type tests in college (76 percent) than in SAT testing (61 percent). Six percent

of LD students reported sometimes or often taking a different examination in college. Whereas 90 percent of LD respondents reported using extra time for the SAT, only 45 percent reported having extra time for college testing. A similar reduction was also reported on the use of separate testing accommodations in college.

(3) Physically handicapped students. Physically handicapped students reported no use of braille, cassette, or large-type tests in college, yet a few had used these versions of the SAT. Although 79 percent of respondents had extra time for the SAT, only 61 percent reported having extra time in college. Whereas 85 percent had separate accommodations for SAT testing, only 45 percent reported separate accommodations for college testing. Sixteen percent reported the use of special equipment for college testing although none was used for SAT testing.

(4) Visually impaired students. More visually impaired students used regular-type tests in college (81 percent) than elected to use regular-type SATs (22 percent). Whereas 64 percent of visually impaired respondents used large-type versions of the SAT, only 14 percent reported ever using large-type tests in college. Fewer were given extra time or a separate room in college (66 and 32 percent) than were given those accommodations for SAT testing (91 and 77 percent). In college testing, more use was made of readers and special equipment. For example, only 5 percent of visually impaired respondents reported the use of a reader for the SAT, while 31 percent used readers for college testing.

GRE respondents. A comparison of special testing arrangements made for the GRE and for college testing is presented in Table 9.

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Insert Table 9 about here

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Overall, braille and large-type tests were used more often for GRE testing (7 and 28 percent) than for college testing (1 and 8 percent). Cassette and regular-type tests were used more often in college testing (12 and 82 percent) than were selected for GRE testing (6 and 61 percent). Twelve percent of GRE respondents reported taking different examinations in college.

Fewer GRE respondents were given extra time or a separate room for college testing than used those accommodations for taking the GRE-a pattern which held up across disability groupings. Similar percentages of respondents overall used an amanuensis or a reader, although in college testing they were less often reported by learning-disabled respondents and more often reported by visually impaired respondents. More specific information will be reported by disability groupings.

(1) Learning-disabled respondents. The most evident differences in accommodations for GRE and college testing were in extra time and separate rooms. Whereas 98 percent of LD respondents used extra time for the GRE, only 53 percent ever used extra time for college tests. A similar reduction is seen for the use of a separate room. Also, 24 percent of LD respondents reported the use of a reader for the GRE while only 11 percent reported that use in college. Fourteen percent of LD students reported sometimes taking examinations different from the rest of the class.

(2) Physically handicapped respondents. Fewer physically handicapped students reported taking regular-type tests in college (84 percent) than selected them for the GRE (94 percent). In college 8 percent reported some use of cassette tests and 8 percent reported sometimes taking different tests. Fewer reported extra time and a separate room for college tests (47 and 46 percent) than for GRE testing (76 percent and 94 percent).

(3) Visually impaired respondents. Fewer visually impaired respondents reported using braille or large-type tests in college (3 and 16 percent) than for the GRE (14 and 53 percent). More respondents reported using cassette or regular-type tests in college (20 and 77 percent) than for the GRE (9 and 28 percent). Fifteen percent reported sometimes taking different examinations. Fewer visually impaired students used extra time and a separate room in college (54 and 56 percent) than for the GRE (87 and 93 percent). Amanuenses, readers, and special equipment were reported as used more frequently in college testing (45, 44, and 41 percent) than for the GRE (35, 28, and 19 percent).

Discussion. In general, colleges offer special versions of tests--e.g. braille, cassette, or large-type versions--less consistently than do admissions testing programs. Perhaps this is reasonable considering the frequency with which different tests would have to be produced for college testing. Whereas a braille admissions test might be repeatedly used over a period of years, a braille final exam might be used only once. When alternate versions of tests are available--as for the SAT and GRE--some disabled students will select them in preference to the regular version. When special versions are not generally available--as in most college testing situations--other accommodations are made or different tests are given.

According to respondents, extra time and a separate room are offered more frequently in special testing accommodations for the SAT and GRE than in college testing. Perhaps extra time may not be needed if college testing is not speeded. However there were gratuitous complaints from respondents especially SAT respondents, about the lack of extra time for taking tests in college.

Summary & Review of Special Testing Accommodations

For respondents to the SAT and GRE questionnaires, the special testing accommodations they received were largely satisfactory. Overall, 94 percent of SAT respondents and 86 percent of GRE respondents were satisfied with their arrangements. The greatest sources of dissatisfaction reported by handicapped respondents were the difficulty of the tests, and not having enough time to finish--sources of dissatisfaction which might well be reported by nonhandicapped people as well. Less frequent complaints were reported on procedural errors and poor testing environments--two kinds of unfortunate mistakes which should happen with less frequency as we increase our capabilities for monitoring special test administrations.

Respondents with hearing, learning, physical, and visual disabilities reported their areas of greatest difficulty in admissions tests. For hearing-impaired respondents (SAT only) vocabulary and reading comprehension were most difficult. Lots of reading and reading comprehension were difficulties reported by learning-disabled respondents. Almost two-thirds of physically handicapped respondents reported no questions were more difficult because of their handicaps. Graphic material and lots of reading created difficulty for visually impaired respondents.

In a comparison of admissions and college testing, the College Board, the Graduate Record Examinations Board, and ETS appear to offer as much or more by way of testing accommodations for handicapped people as do colleges and universities. Multiple versions of admissions tests allow personal choice, and extra testing time may help to compensate for slower modes of testing or decreased speed of performance due to a disability.

A Tentative Look Within Disability Groupings

With only a 40% response rate for college candidates having hearing, physical, or visual disabilities and an even lower response rate--25%--for LD candidates, the SAT data base is not as strong as it might be. Additionally, the SAT respondents tend to be more female and to earn higher SAT scores than the group originally contacted. The GRE questionnaire had a better response rate, but the total number of respondents was less than half that of the SAT. Despite these shortcomings the SAT data base, with more than 800 respondents, and the GRE data base, with about 250, contain the best information currently available on the kind or severity of disabilities within disability groupings of people taking special administrations of admissions tests. Keeping in mind the tentative nature of the findings to be reported in this section, we will look within disability groups at the kinds of information already discussed for the larger groups.

Hearing-Impaired Respondents

Hearing-impaired recipients of the SAT and GRE questionnaires were asked to respond whether they were (1) most fluent in English, (2) most fluent in American Sign Language (ASL) or a manual language, or (3) equally fluent in

both. There were no GRE respondents who reported being hearing impaired, but the data for SAT respondents are reported in Table 10.

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Insert Table 10 about here

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One of the first trends seen in the data is the tendency for people who are most fluent in English to earn higher scores on the SAT than people who are most fluent in a manual languge. Respondents who reported equal fluency scored between the other two. The finding seems reasonable both intuitively and on the basis of earlier studies. Karchmer, Milone, and Wolk (1979) noted that students with less-than-severe hearing loss relied primarily on speech for communication, and two-thirds were enrolled in mainstreamed, integrated school programs. In contrast, 80 percent of profoundly deaf students relied heavily on manual communications, and almost two-thirds were in residential schools for the deaf. Severely impaired students characteristically fell between the other two groups. Jones and Ragosta (1982) found the SAT scores of prelingually deaf students to be considerably lower than the SAT scores of those deafened later in life or with less profound hearing loss.

The SAT scores presented in this study appear to reflect the severity of the auditory disability. The percent of hearing-impaired respondents using an interpreter for the SAT or college testing parallels the severity of disability. Few or none of those most fluent in English used an interpreter for SAT or college testing, while about 70 percent of those most fluent in a manual language did. The percentage of respondents offered different final examinations in college increased with the lack of fluency in English, so

that 44 percent of manually communicating respondents reported sometimes taking different exams.

Although there appear to be trends in the data associated with language fluency, there are no differences in the version of SAT used and few apparent trends in the conditions of testing. The use of an interpreter is the most obvious difference across groups. This differs markedly from the data to be reported for visually impaired students who use different versions of the SAT or GRE depending on their levels of disability. Although both visually and hearing-impaired respondents have sensory disabilities, adaptations for visually handicapped test takers appear to have been more successfully implemented than adaptations for people with hearing impairments.

Learning-Disabled Respondents

Students identifying themselves as having a learning disability were asked to indicate their area of greatest difficulty: writing, reading, reading and writing, or mathematics. Data on LD students within each of those categories are presented in Table 11a for SAT respondents and Table 11b for GRE respondents.

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Insert Tables 11a and 11b about here

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No consistent pattern emerges except that the mean SAT and GRE mathematics (quantitative) scores are lowest for the groups reporting math as most difficult. The same groups report their most difficult questions are in the mathematics (quantitative) subtests. Those who report that their area of

greatest difficulty is reading or reading and writing, also report that their most difficult test questions are those with lots of reading.

Little or nothing was gained by trying to identify subgroups of LD students by their areas of greatest difficulty, although respondents appear to be consistent in identifying verbal or quantitative problem areas.

Learning-disabled students took advantage of three of the four SAT and GRE versions available for special test administrations. Data are reported in Tables 12a and 12b by cassette, large-type, or regular-type versions. No immediately apparent trends are obvious from the data.

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Insert Tables 12a and 12b about here

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Physically Handicapped Respondents

Within the physically handicapped category, recipients of the questionnaires were asked to indicate which of a number of subcategories best described their disabilities. The distribution of physically handicapped people across subcategories is given in Table 13.

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Insert Table 13 about here

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Only 5 categories of disabilities had 10 or more respondents from the SAT survey. Only 4 of the 5 categories had close to that number of GRE respondents. Data for those categories are reported in Tables 14a and 14b.

The group of multiply handicapped students were identified either because they responded to a multiple-handicaps descriptor, or they listed two or more disability categories.

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Insert Tables 14a and 14b about here

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Although the numbers of respondents are too few to work with in any meaningful way, the data do show wide diversity among people who are physically handicapped. The majority of quadriplegic respondents reported the age of onset of disability as high school or beyond while almost all cerebral-palsied respondents were diagnosed before they entered high school. In the one case, respondents' basic educational skills were obtained prior to a disability; in the other case, a disability was present throughout respondents' educational careers. Respondents with "other" disabilities than those listed tended to have acquired those disabilities in high school or later, while respondents with multiple disabilities tended to have been diagnosed at least by elementary school.

Respondents with multiple handicaps tended to identify problems with specific kinds of GRE or SAT test questions. Only 13-14 percent reported that no questions were more difficult because of their disability. The greatest problem--reported by 46 percent of multiply handicapped SAT respondents and 55 percent of GRE--was lots of reading. In contrast, only 6-8 percent of quadriplegic respondents reported difficulty with lots of reading.

The subgroups within the physically handicapped category seem so diverse that identifying the groups as one cluster of disabled people might mask effects one would want to study. The data presented here are preliminary and tentative, but they do indicate there might be a problem with the broad category of physical disability.

Visually Impaired Respondents

Visually impaired recipients of the questionnaires were asked whether they were totally blind, legally but not totally blind, or not legally blind. Differences within the visually impaired samples in this study are presented in Tables 15a and 15b.

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Insert Tables 15a and 15b about here

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Trends within the data show most of the totally blind SAT and GRE respondents using the braille versions of the SAT and GRE. A smaller percentage of totally blind respondents--perhaps many of those most recently blinded--use the cassette version. In college more than 90 percent of totally blind respondents report using readers and amanuenses in the testing situation, and they are more likely to use special equipment. Totally blind respondents at the SAT level (65 percent) and the GRE level (78 percent) report difficulty with graphic material in standardized tests but were least likely to report difficulty with lots of reading.

Respondents who were less than totally blind were most likely to report using the large-type version of the SAT or GRE, although many reported using

the regular-type version. Those who were not legally blind were least likely to use readers, amanuenses, or special equipment for college or standardized testing.

There appear to be patterns within the visually impaired samples in this study related to the severity of the visual disability. Differences involve the versions of tests used and the conditions of testing. A second method of looking at the data for visually impaired respondents is across different versions of the SAT and GRE. Those data are reported in Tables 16a and 16b.

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Insert Tables 16a and 16b about here

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Trends within the data are similar to those already discussed because the test versions are tied closely to the level of visual disability.

Discussion

A tentative look within disability groupings has indicated that there are patterns of differences which could be explored. The least productive data were those attempting to describe differences within the learning-disabled group. Subcategories involving areas of greatest difficulty showed little more than consistency among respondents who reported greatest difficulty with mathematics as opposed to reading and/or writing.

Within the physically handicapped category were respondents with many different disabilities--presumably with different degrees of disability. The small numbers of people within most of the subgroups would probably prevent separate analyses of data even if the effort were made to find every

individual. One evident source of variation within the physically handicapped samples in this study is age of onset. Some groups--e.g., cerebral-palsied respondents or multiply handicapped respondents--tended to have been diagnosed prior to entering school and to have had their disabilities throughout their school careers. Other groups tend to contain many individuals who were disabled later in life, after their basic education was completed.

Within the visually handicapped group of respondents there were patterns of test use and testing conditions related to the severity of the visual disability. Totally blind individuals tended to use braille or cassette versions of the SAT and GRE and to make greater use of readers, amanuenses, and special equipment in college testing. Respondents who were less than totally blind tended to use large-type or regular versions of the SAT and GRE and report difficulty with lots of reading on standardized tests.

There was little variety in the versions of the SAT used within subgroups of hearing-impaired respondents. Almost all used the regular-type version. The range of testing adaptations for hearing-impaired respondents clearly do not approach those devised for visually impaired respondents. Hearing-impaired respondents who reported greatest fluency with a manual language had the lowest SAT scores of any subgroup of handicapped people.

Although the data reported in this section describe only the sample of disabled students responding to the questionnaires used in this study, the data raised interesting questions for further research. In what ways, if any, can learning disabled people be categorized? Do the physically handicapped people asking for special test administrations of the SAT or GRE hold together as a group? Is there a way to adapt tests for varying levels of hearing impairment similar to accommodations made for varying levels of

visual impairment? Answers to those questions are beyond the scope of this report and await further study.

Summary and Recommendations

This study has reported the findings from surveys sent to disabled students who had taken special test administrations of the SAT or GRE. The study focused on test-takers with hearing impairments, learning disabilities, physical handicaps, or visual impairments. The study investigated satisfaction with special accommodations and test questions which were more difficult because of special disabilities. It compared accommodations provided for admissions tests with accommodations for academic testing in college. Finally, it took a tentative look within the four disability groups.

Special testing accommodations were overwhelmingly approved by 94 percent of SAT respondents and 86 percent of GRE respondents. However, the study focused on the dissatisfaction reported by a minority of test-takers in order to improve service. Dissatisfaction with the tests themselves--expressed in statements about level of difficulty and low scores obtained--is difficult to overcome. Nonhandicapped test takers would likely make similar complaints. A series of studies is currently underway, however, to determine for specific groups of handicapped people the predictive validity of the SAT and GRE, their item characteristics, and their underlying structures.

Complaints that the handicapped versions of the SAT and GRE tests are different from those of nonhandicapped people are partly accurate. Tests used for special test administrations have a history of general use but are

retired for security reasons when they are selected for use with handicapped people. Beginning with the 1985-86 school year, the SAT will be offered on national test dates on a trial basis to learning-disabled test takers whose only requirement is a limit of up to one and a half hours of extra time. The new service will offer simultaneous use of identical tests for handicapped and nonhandicapped people and will allow some handicapped individuals to take advantage of the question-and-answer service offered on certain test dates. Since the majority of special test administrations of the SAT are for learning-disabled people who require only additional time, the new service will be available to a large proportion of handicapped candidates. However, it will not be available to many others who require special versions of the SAT such as braille, cassette, or large-type, or who require other accommodations such as special equipment, a reader, amanuensis, interpreter, or other kinds of special attention. For those individuals, the current special testing accommodations remain in effect as they do for GRE test takers. Although a question-and-answer option is not available, an alternative strategy is the use of released forms of the SAT or GRE for practice prior to actual testing. Three publications--Ten SATs (College Board, 1983) and Practicing to Take the GRE General Test: Second Edition and No. 3 (ETS, 1984 and 1985)--contain copies of actual tests in recent use. The publications are available in regular type only. One recommendation for the future would be to provide for sale full-length braille, cassette, and large-type tests, together with answer sheets and a scoring key. Retired versions of these tests could be made available to educational institutions or to disabled people either on loan or for sale. Some materials, e.g. cassette tests, are currently available on loan as

practice materials, but there are no special versions available for purchase.

A second type of complaint involved the physical conditions under which tests were taken. Testing space should not be a controversial issue, but several test-takers complained of noisy testing conditions, being seated in a hallway, or not having enough working space. The Guide to Administering ETS Tests (ETS, 1984) deals with these issues for both handicapped and nonhandicapped test takers. Clearly, all examinees have a right to be tested under comfortable, quiet conditions with enough space to accommodate their needs. All test administrators should be sensitive to and responsible for providing adequate physical accommodations for test takers with special needs. Most test administrators already are--as evidenced by complimentary comments from respondents. However, one goal that ETS can work toward is further improvement of its good record.

We recommend a system for monitoring special test administrations by obtaining feedback from disabled students on the adequacy of their accomplishments. There were a variety of complaints about readers. Some readers were too fast or too slow, would not reread test questions, distracted test takers by talking or making noise, or were otherwise unsatisfactory. There is currently no set of guidelines for SAT readers; in light of the number of complaints, a manual might be useful. We recommend such a document be produced. The guidelines for GRE readers might be revised to include additional information about pacing the test.

Information was reported on the type of test questions which create difficulty for people with specific disabilities. Questions with lots of reading created special difficulties for learning-disabled people and for those with visual disabilities. Visually impaired people also reported

difficulty with graphic material. Hearing-impaired people had difficulty with a lot of reading and with reading comprehension but reported their greatest difficulty was vocabulary. Physically handicapped people more frequently reported that no questions were more difficult because of their specific difficulties. Despite difficulties associated with specific kinds of test items and despite some complaints about the special test administrations, most handicapped respondents were satisfied with their testing accommodations.

In the comparison of admissions testing with academic testing in college, special arrangements for the SAT and GRE appeared to offer at least as much accommodation as postsecondary institutions provide. Colleges provide fewer special versions of tests--e.g. braille, cassette, or large-type versions--but either provide alternate accommodations or give different tests. When provided with a variety of options many disabled students chose alternate versions of the SAT or GRE in preferance to other accommodations.

The tentative look within disability groups proved intriguing. Patterns of differences warranting further research became apparent. Although the attempt to find subgroups of learning-disabled test takers was, by and large, uninformative, the attempt was much more successful for the other groups. Visually impaired respondents identified themselves as not legally blind, legally but not totally blind, or totally blind. Totally blind respondents tended to use braille versions of the SAT and GRE or, to a lesser extent, cassette versions. They reported difficulty with graphic material much more often than those with less severe visual impairments and reported least difficulty with lots of reading. Many from the subgroups of those who were less than totally blind were able to use regular versions of the SAT and GRE, although a larger number used the large-type versions.

Since the SAT and GRE versions are so closely tied to the level of visual disability, difficulties with graphic material reported by totally blind respondents might show up in analyses of data from braille test administrations. Thought should be given to the implications of a finding that graphic material in standardized tests might be associated with poorer performance by totally blind test takers.

Hearing-impaired respondents to this survey appeared to show patterns of performance related to their level of disability, but there were no special versions of the SAT to help compensate. Respondents who were most fluent in a manual language received the lowest scores on the SAT while those most fluent in English received the highest scores. Respondents who were equally fluent scored between the other two groups. The only pattern of accommodation which was associated with the level of disability was the use of an interpreter for the test directions. The contrast between accommodations offered to totally blind test-takers--braille or cassette versions of tests, or a reader/amanuensis--and those offered to profoundly deaf test takers is worth consideration. On the surface at least it would appear feasible to offer standardized tests in a manual language. It seems analogous to offering blind students tests with a cassette or reader. Further research is warranted on ways to accommodate hearing-impaired test takers whose primary mode of communication is a manual one.

The category of physical disability has been used in this study to cover all handicaps which are not visual, hearing impairments, or learning disabilities. The category contains people with a wide assortment of disabilities and adaptations; some of these people have been disabled from birth, and some have disabilities that have been recently acquired. The number of people within many of the subgroups is so small as to preclude

extensive research by specific type of disability. Because research on the total group could overlook important information on a small subgroup, it is important to become increasingly aware of the needs of individual disabled people.

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Table 1

SAT Data
A Comparison of the Ns, SAT Scores, and Sex of Disabled Students
Contacted for the Study with Those Students Who Returned the Questionnaire

	Contacts				Returns (Total)				
		SAT Scores*		Percent			SAT Scores*		Percent
	N	V	M	Male	N	%	V	M	Male
Disability									
Hearing	305	293	373	48%	123	40	292	383	43%
Learning	1093	359	395	72%	275	25	380	428	70%
Physical	326	414	441	56%	131	40	420	445	51%
Visual	767	423	463	55%	307	40	440	476	50%
Multiple	64	390	421	73%	20	31	427	440	70%
Total	2555	378	419	62%	856	33.5	396	442	56%

*1982-83 Norms for College-Bound Seniors: N = 950,000+
SAT-V 425
SAT-M 468
% Male 52%

Table 2

GRE Data
A Comparison of the Ns, GRE Scores, and Sex of Disabled Students
Contacted for the Study With Those Students Who Returned the Questionnaire

	Contacts					Returns (Total)				
		GRE Scores*			Percent			GRE Scores*			Percent
	N	V	Q	A	Male	N	%	V	Q	A	Male
General Test											
Disability											
Hearing	0	-	-	-	-	-	-	-	-	-	-
Learning	56	497	503	567	56%	51		498	523	566	58%
Physical	71	465	449	500	53%	63		482	460	513	45%
Visual	146	487	479	511	47%	107		492	476	522	48%
Multiple	10	380	419	446	50%	15		483	515	513	31%
Other	6	495	520	467	50%						
Missing	40	478	498	510	59%						
Total	329	480	478	515	52%	236	71.7%	490	484	528	48%
Subject Test											
Total	39	-	-	-	-	32	82.0%	-	-	-	-
All Contacts											
Total	368	-	-	-	51%	268	72.8%	-	-	-	49%

*National Norms for 1983-84: GRE-V 475
GRE-Q 541
GRE-A 512

Table 3

Student Disabilities by Classification at Testing and by Response to Questionnaire

		Disability Responses on Questionnaire					
	N	Hearing	Learning	Physical	Visual	Other	Total
SAT Testing							
Disability							
Hearing	123	119	7	6	4	1	137
Learning	276	6	264	7	10	4	291
Physical	131	4	8	120	12	4	148
Visual	307	9	46	14	265	2	336
Multiple	20	7	13	7	8	0	35
Total	857	145	338	154	299	11	947
GRE Testing							
Hearing	0	0	0	0	0	0	0
Learning	63	0	58	5	3	0	66
Physical	68	4	4	63	2	4	77
Visual	126	1	10	11	119	1	142
Multiple	7	3	3	2	0	0	8
Other	4	1	1	4	1	1	8
Total	268	9	76	85	125	6	301

Table 4

Awareness of Special Testing Accommodations
& Source of That Knowledge: Overall & by Disability

	Overall	Disability			
		Hearing	Learning	Physical	Visual
SAT Survey					
N (Respondents)	857	123	276	131	307
% Awareness of Special Accommodations	32%	40%	39%	35%	22%
% Learned from:					
H.S. Counselor	50%	50%	39%	71%	51%
Special-Ed Teacher	37%	39%	47%	22%	33%
Student	4%	6%	3%	3%	4%
Agency for Handicapped	8%	5%	3%	4%	16%
College Counselor	5%	6%	4%	6%	5%
ETS	5%	5%	3%	7%	6%
Other	17%	18%	20%	11%	15%
GRE Survey					
N (Respondents)	261	-	59	66	120
% Awareness of Special Accommodations	81%	-	76%	79%	84%
% Learned from:					
College Counselor	15%	-	15%	9%	18%
Special Serv. Personnel	14%	-	19%	5%	18%
Fellow Student	7%	-	5%	11%	6%
Agency for Handicapped	5%	-	3%	-	8%
Graduate School	5%	-	3%	9%	5%
ETS	66%	-	46%	71%	74%
Other	15%	-	31%	11%	9%

Table 5

Satisfaction with Special Testing Accommodations

	Overall	Hearing	Learning	Physical	Visual
SAT Survey					
N	857	123	276	131	307
% Satisfied	94%	88%	92%	97%	95%
GRE Survey					
N	261	-	59	66	120
% Satisfied	86%	-	86%	85%	86%

Table 6

Difficult Test Questions for Disabled Students
Overall and by Disability

	Overall	Disability			
		Hearing	Learning	Physical	Visual
SAT Survey					
N (Respondents)	857	123	276	131	307
% Reporting difficult test questions:					
None	29%	24%	11%	66%	33%
Lots of reading	43%	40%	57%	13%	43%
Reading comprehension	37%	51%	54%	8%	28%
Vocabulary	27%	59%	44%	8%	9%
Mathematics	20%	18%	27%	24%	14%
Graphics	15%	11%	9%	8%	24%
GRE Survey					
N (Respondents)	261	-	59	66	120
% Reporting difficult test questions:					
None	28%	-	2%	61%	25%
Verbal ability	13%	-	31%	9%	7%
Quantitative ability	23%	-	34%	23%	18%
Analytic ability	20%	-	29%	17%	14%
Graphic material	31%	-	19%	11%	48%
Lots of reading	44%	-	66%	18%	44%

Note: Percentages do not sum to 100 because respondents often identified more than one type of difficult question.

Table 7

Number and Percentage of Sample Attending College This Year:
By Disability and Type of College

		Disability				
	Overall	Hearing	Learning	Physical	Visual	Multiple
SAT Survey						
N (Respondents)	828	118	265	127	299	19
% Attending college this year	57%	66%	61%	49%	52%	64%
4-Year	69%	75%	63%	65%	74%	64%
2-Year	31%	25%	37%	35%	26%	36%
GRE Survey						
N (Respondents)	256	-	56	64	120	16
% Attending college this year	74%	-	79%	75%	72%	62%

Table 8

Number and Percent of Disabled Students Using Special Testing Arrangements for the SAT and for College Testing: Overall and by Disability

	SAT Tests College Attending														
	All SAT Tests					SAT Respondents					College Tests				
	Overall	H*	L*	P*	V*	Overall	H*	L*	P*	V*	Overall	H*	L*	P*	V*
Number of Responses	857	123	276	131	307	469	78	162	62	155	430	68	154	58	146
Percent Using Special Versions**															
Braille Test	4	-	-	-	11	5	-	-	2	14	3	-	-	-	8
Cassette Test	13	1	32	2	7	14	-	32	3	6	4	3	7	-	3
Large-Type Test	34	3	19	13	67	31	1	19	11	64	8	6	5	-	14
Regular-Type Test	55	96	61	86	20	58	99	61	89	22	81	88	76	87	81
Different Test	-	-	-	-	-	-	-	-	-	-	10	29	6	5	6
Percent Using Special Conditions**															
Extra Time	86	63	91	81	92	84	58	90	79	91	51	42	45	61	66
Separate Room	73	54	68	81	80	72	53	70	85	77	34	22	26	45	32
Amanuensis (Recorder)	14	2	3	31	21	13	1	2	34	19	17	7	5	36	26
Reader	12	5	20	11	8	11	3	20	6	5	20	10	17	10	31
Interpreter	6	26	3	-	3	7	28	4	-	3	10	39	6	3	1
Special Equipment	5	1	3	-	10	5	1	3	-	10	17	1	5	16	31

* H=Hearing impaired, L=Learning disabled, P=Physically handicapped, V=Visually impaired

**Percentages do not sum to 100 because some students took more than one version of the test (e.g. cassette plus regular type) and most students used more than one special testing condition.

Table 9

Number and Percent of Disabled Students Using Special Testing Arrangements for the GRE and for College Testing: Overall and by Disability

	GRE					College Testing				
	Overall	H*	L*	P*	V*	Overall	H*	L*	P*	V*
Number of Responses	221	-	59	66	120	243-249	-	56-57	63-64	108-112
Percent Using Special Versions**										
Braille Test	7	-	-	-	14	1	-	-	-	3
Cassette Test	6	-	5	-	9	12	-	2	8	20
Large-Type Test	28	-	8	6	53	8	-	-	3	16
Regular-Type Test	61	-	90	94	28	82	-	91	84	77
Different Test	-	-	-	-	-	12	-	14	8	15
Percent Using Special Conditions**										
Extra Time	87	-	98	76	87	52	-	53	47	54
Separate Room	91	-	88	94	93	48	-	40	46	56
Amanuensis (Recorder)	30	-	12	41	35	30	-	5	32	45
Reader	21	-	24	6	28	24	-	11	5	44
Interpreter	-	-	-	-	1	2	-	2	2	4
Special Equipment	11	-	2	3	19	23	-	5	10	41

* H=Hearing impaired, L=Learning disabled, P=Physically handicapped, V=Visually impaired

**Percentages do not sum to 100 because some students took more than one version of the test (e.g. cassette plus regular type) and most students used more than one special testing condition.

Table 10

Differences Within the Hearing Handicapped Sample: SAT Data

	Language Fluency		
	English	Equally fluent in both	Manual Communications
Variables			
N (SAT Respondents)	45	39	23
% Male	42%	36%	74%
SAT - Verbal: $\bar{X}$ (SD)	323 (108)	289 (78)	236 (46)
SAT - Math: $\bar{X}$ (SD)	411 (133)	380 (97)	342 (100)
H.S. GPA: $\bar{X}$ (SD)	2.85 (0.44)	3.02 (0.57)	3.01(0.47)
% In College	54%	72%	78%
% > 2.5 GPA (College)	70%	87%	71%
SAT Test Version			
% Regular type	100%	100%	100%
% Satisfied: SAT	98%	82%	78%
Conditions of Testing			
% Different final exams	17%	33%	44%
% Different room (SAT)	73%	38%	26%
(College)	19%	25%	27%
% Extra time (SAT)	82%	54%	48%
(College)	24%	52%	53%
% Interpreter (SAT)	-	33%	70%
(College)	10%	56%	71%
Difficult Test Questions			
% None	24%	23%	26%
% Lots of reading	42%	30%	52%
% Reading comprehension	42%	51%	48%
% Vocabulary	62%	59%	48%
% Mathematics	13%	15%	26%
% Graphics	2%	15%	17%
Age of Onset			
Birth	59%	51%	57%
Preschool	30%	39%	43%
Elementary	11%	7%	-
Middle or Jr. High	-	3%	-
High School	-		-
After High School	-		-

Table 11a

Differences Within the LD Sample: SAT Data

	Area of Greatest Difficulty			
	Writing	Reading	Reading & Writing	Mathematics
Variables				
N (SAT Respondents)	25	101	124	35
% Male	76%	61%	72%	64%
SAT-Verbal: $\bar{X}$ (SD)	436 (105)	388 (88)	378 (89)	376 (92)
SAT-Math: $\bar{X}$ (SD)	488 (82)	464 (121)	437 (122)	358 (97)
H.S. GPA: $\bar{X}$ (SD)	2.60 (0.59)	2.69 (0.52)	2.59 (0.57)	2.69(0.46)
% in college	68%	65%	66%	48%
% > 2.5 GPA (college)	58%	36%	58%	74%
SAT Test Versions				
% Cassette	28%	22%	33%	17%
% Large-Type	24%	18%	19%	33%
% Regular Type	56%	75%	58%	50%
Conditions of Testing				
% Different final exams	13%	8%	7%	21%
% Different room (SAT)	64%	66%	73%	67%
(College)	35%	16%	33%	-
% Extra time (SAT)	92%	98%	89%	89%
(College)	47%	42%	47%	15%
% Reader (SAT)	4%	16%	24%	17%
(College)	13%	8%	24%	8%
Difficult Test Questions				
% None	28%	10%	4%	17%
% Lots of reading	12%	68%	73%	33%
% Reading comprehension	24%	65%	63%	22%
% Vocabulary	32%	46%	54%	11%
% Mathematics	20%	14%	23%	69%
% Graphics	8%	7%	9%	17%
Age of Onset				
% Birth	-	-	-	-
% Preschool	4%	8%	9%	11%
% Elementary School	50%	60%	68%	50%
% Middle or Jr. High	29%	17%	10%	25%
% High School	17%	15%	13%	14%
% After High School	-	-	-	-

Table 11b

Differences Within the LD Sample: GRE Data

	Area of Greatest Difficulty			
	Writing	Reading	Reading & Writing	Mathematics
Variables				
N (GRE Respondents)	2	11	29	7
GRE-V: $\bar{X}$ (SD)		478	481 (105)	529 (120)
GRE-Q: $\bar{X}$ (SD)		562	504 (160	480 (126)
GRE-A: $\bar{X}$ (SD)		579	544 (147)	541 (153)
N: Total Respondents	3	12	33	9
% Male	100%	42%	61%	56%
College Grades				
% > 2.5 GPA		91%	97%	100%
% > 3.0 GPA		64%	63%	89%
% > 3.5 GPA		36%	27%	33%
Conditions of Testing				
% Different final exam	-	-	19%	22%
% Different room (GRE)	-	92%	82%	100%
(College)	-	33%	44%	33%
% Extra time (GRE)	-	100%	97%	100%
(College)	-	33%	64%	38%
% Reader (GRE)	-	25%	30%	-
(College)	-	17%	10%	-
Difficult Test Questions				
None	-	8%	-	-
Verbal Questions	-	33%	42%	-
Quantitative Questions	-	25%	21%	78%
Analytical Questions	-	8%	27%	56%
Graphic Material	-	8%	15%	33%
Lots of Reading	-	67%	76%	44%
Age of Onset				
Birth	-	-	-	-
Preschool	-	-	-	11%
Elementary School	-	42%	44%	11%
Middle or Jr. High	-	-	6%	-
High School	-	-	9%	11%
After High School	-	58%	41%	67%

Table 12a

Differences Across SAT Test Versions: LD Students

	SAT Versions		
	Cassette	Large-Type	Regular Type
N (SAT Respondents)	109	53	111
% Male	71%	81%	62%
SAT-Verbal: $\bar{X}$ (SD)	371 (82)	379 (101)	387 (98)
SAT-Math: $\bar{X}$ (SD)	414 (114)	422 (121)	443 (129)
H.S. GPA: $\bar{X}$ (SD)	2.58 (0.60)	2.63 (0.52)	2.71 (0.50)
% in College	60%	60%	63%
% > 2.5 GPA	64%	53%	70%
Test Version (College)			
Cassette	16%	3%	-
Large-Type	8%	10%	-
Regular Type	78%	74%	75%
Conditions of Testing			
Different final exams	6%	10%	5%
Different room (SAT)	74%	70%	63%
(College)	40%	20%	15%
Extra time (SAT)	91%	91%	90%
(College)	48%	48%	39%
Reader (SAT)	17%	28%	18%
(College)	23%	28%	5%
Equipment (SAT)	8%	-	-
(College)	10%	3%	-
Difficult Items			
None	10%	13%	10%
Lots of Reading	63%	57%	51%
Reading Comprehension	55%	47%	55%
Vocabulary	49%	43%	40%
Mathematics	25%	36%	24%
Graphics	10%	11%	8%
% Satisfied: SAT	92%	92%	92%
Age of Onset			
Birth	3%	4%	3%
Preschool	5%	9%	12%
Elementary School	63%	47%	60%
Middle or Jr. High	14%	17%	14%
High School	14%	21%	12%
After High School	1%	2%	-

Table 12b

Differences Across GRE Test Versions: LD Students

	Cassette	GRE Versions Large-Type	Regular Type
Variables			
N (GRE Respondents)	8	1	50
% Male	63%	-	58%
GRE-V: $\bar{X}$ (SD)	501 (46)	-	495 (101)
GRE-Q: $\bar{X}$ (SD)	599 (139)	-	509 (132)
GRE-A: $\bar{X}$(SD)	600 (117)	-	560 (143)
College Grades:			
% > 2.5 GPA	88%	-	98%
% > 3.0 GPA	75%	-	71%
% > 3.5 GPA	25%	-	31%
Test Versions (Colleges)			
Cassette	-	-	2%
Large-Type	-	-	-
Regular Type	86%	-	92%
Conditions of Testing			
Different final exam	-	-	17%
Different room (GRE)	100%	-	86%
(College)	50%	-	40%
Extra time (GRE)	100%	-	98%
(College)	50%	-	54%
Reader (GRE)	50%	-	20%
(College)	25%	-	9%
Equipment (GRE)	13%	-	-
(College)	-	-	6%
Difficult Items			
% None	13%	-	-
Verbal Questions	25%	-	32%
Quantitative Questions	13%	-	38%
Analytical Questions	13%	-	30%
Graphic Material	-	-	22%
Lots of Reading	75%	-	64%
% Satisfied: GRE	87%	-	86%
Age of Onset			
Birth	-	-	-
Preschool	-	-	4%
Elementary School	38%	-	41%
Middle or Jr. High	-	-	-
High School	12%	-	6%
After High School	50%	-	49%

Table 13

Distribution of Physically Handicapped Respondents

# Respondents SAT	# Respondents GRE		# Respondents SAT	# Respondents GRE	
4	5	Paraplegia	0	0	Cancer
26	16	Quadriplegia	1	2	Diabetes
1	3	Post Polio	5	3	Epilepsy
3	0	Spina Bifida	1	0	Heart Disease
39	9	Cerebral Palsy	0	0	Speech Impairment
13	2	Muscular Dystrophy	4	0	Psychological Problems
1	4	Multiple Sclerosis	61	28	Multiple Handicaps
1	0	Missing Limbs	29	17	Other (Not Listed)

Table 14a

Differences Within the SAT Physically Handicapped Sample

	Disability				
	Quadriplegia	Cerebral Palsy	Muscular Dystrophy	Other	Multiple Handicaps
Variables					
N (SAT respondents)	26	39	13	29	61
% Male	73%	46%	38%	45%	44%
SAT-Verbal: $\bar{X}$ (SD)	439 (80)	391 (111)	430 (96)	443 (117)	378 (106)
SAT-Math: $\bar{X}$ (SD)	474 (110)	424 (101)	438 (110)	478 (113)	408 (124)
H.S. GPA: $\bar{X}$ (SD)	3.06 (0.63)	3.01 (0.49)	2.98 (0.52)	3.08 (0.54)	2.91 (0.49)
% in college	73%	39%	33%	45%	66%
% > 2.5 GPA (college)	83%	67%	75%	92%	83%
SAT Test Versions					
Braille	-	-	-	-	5%
% Cassette	-	3%	-	14%	8%
% Large Type	12%	21%	15%	14%	39%
% Regular Type	88%	76%	85%	79%	52%
Conditions of Testing					
% Different final exams	-	6%	25%	-	8%
% Different room (SAT)	85%	85%	100%	62%	89%
(College)	53%	44%	50%	27%	39%
% Extra time (SAT)	85%	90%	77%	69%	84%
(College)	65%	56%	50%	36%	64%
% Reader (SAT)	12%	18%	7%	7%	13%
(College)	18%	6%	-	9%	14%
% Recorder (SAT)	62%	33%	23%	14%	11%
(College)	59%	25%	25%	18%	17%
Difficult Questions					
% None	54%	69%	92%	66%	13%
% Lots of reading	8%	21%	-	24%	46%
% Reading Comprehension	4%	13%	-	21%	43%
% Vocabulary	-	8%	-	13%	30%
% Mathematics	35%	15%	8%	17%	31%
% Graphics	8%	13%	-	13%	25%
Age at Onset					
Birth	15%	62%	-	7%	34%
Preschool	4%	36%	39%	4	32%
Elementary	-	2%	46%	21%	18%
Middle	19%	-	8%	11%	8%
H.S.	58%	-	7%	54%	8%
Beyond	4%	-	-	3%	-

Table 14b

Differences Within the GRE Physically Handicapped Sample

	Disability				
	Quadriplegia	Cerebral Palsy	Muscular Dystrophy	Other	Multiple Handicaps
Variables					
N (GRE Respondents)	16	9	2	17	28
GRE-V: $\bar{X}$ (SD)	483 (97)	468 (137)	-	528 (134)	469 (100)
GRE-M: $\bar{X}$ (SD)	533 (151)	436 (55)	-	494 (140)	430 (135)
GRE-A: $\bar{X}$ (SD)	569 (162)	480 (135)	-	562 (123)	484 (125)
N: Total Respondents	16	11	-	18	29
% Male	88%	27%	-	44%	38%
College Grades					
% > 2.5 GPA	94%	100%	-	100%	97%
% > 3.0 GPA	81%	100%	-	88%	79%
% > 3.5 GPA	50%	40%	-	69%	38%
GRE Test Versions					
Braille	-	-	-	-	-
% Cassette	-	-	-	-	4%
% Large Type	-	9%	-	-	41%
% Regular Type	100%	91%	-	100%	55%
Conditions of Testing					
% Different final exams	6%	20%	-	6%	8%
% Different room (GRE)	88%	91%	-	89%	83%
(College)	69%	70%	-	19%	38%
% Extra time (GRE)	69%	91%	-	61%	86%
(College)	56%	80%	-	33%	36%
% Reader (GRE)	-	27%	-	-	27%
(College)	6%	10%	-	-	16%
% Recorder (GRE)	88%	82%	-	6%	17%
(College)	75%	60%	-	-	23%
Difficult Questions					
None	63%	45%	-	78%	14%
V.A.	6%	9%	-	-	17%
Q.A.	13%	45%	-	6%	38%
A.A.	13%	18%	-	-	24%
Graphic Material	13%	36%	-	6%	38%
Lots of Reading	6%	27%	-	11%	55%
Age at Onset					
Birth	-	55%	-	-	17%
Preschool	-	45%	-	-	27%
Elementary	-	-	-	11%	28%
Middle	12%	-	-	11%	-
High School	19%	-	-	6%	-
Beyond	69%	-	-	72%	28%

Table 15a

Differences Within the SAT Visually Handicapped Sample

	Range of Disability		
	Not Legally Blind	Legally Blind	Totally Blind
Variables			
N (Respondents)	60	157	31
% Male	52%	48%	52%
SAT-Verbal: $\bar{X}$ (SD)	443 (110)	442 (119)	475 (139)
SAT-Math: $\bar{X}$ (SD)	506 (125)	474 (135)	444 (145)
H.S. GPA: $\bar{X}$ (SD)	3.02 (0.59)	3. 04 (0.61)	3.31 (0.42)
% in College	47%	49%	58%
% > 2.5 GPA (College)	81%	81%	94%
SAT Test Versions			
% Braille	-	5%	87%
% Cassette	3%	8%	16%
% Large-Type	65%	89%	3%
% Regular Type	37%	8%	-
Conditions of Testing			
% Different final exams	3%	4%	17%
% Different room (SAT)	82%	82%	81%
(College)	31%	40%	95%
% Extra time (SAT)	85%	92%	94%
(College)	43%	60%	90%
% Reader (SAT)	3%	11%	6%
(College)	4%	31%	95%
% Recorder (SAT)	12%	21%	84%
(College)	-	24%	95%
% Special equipment (SAT)	2%	10%	42%
(College)	14%	39%	72%
Difficult Test Questions:			
% None	33%	42%	23%
% Lots of Reading	55%	34%	16%
% Reading comprehension	28%	22%	6%
% Vocabulary	5%	5%	6%
% Mathematics	12%	9%	39%
% Graphics	15%	23%	65%
Age at Onset			
Birth	37%	45%	45%
Preschool	28%	28%	36%
Elementary School	20%	17%	13%
Middle or Jr. High	7%	7%	-
High School	8%	2%	3%
After High School	-	1%	3%

Table 15b

Differences Within the GRE Visually Handicapped Sample

	Not Legally Blind	Range of Disability Legally Blind	Totally Blind
Variables			
N: GRE Respondents	20	45	25
GRE-V: $\bar{X}$ (SD)	511 (125)	503 (86)	472 (112)
GRE-Q: $\bar{X}$ (SD)	501 (143)	517 (124)	412 (145)
GRE-A: $\bar{X}$ (SD)	510 (200)	576 (139)	446 (160)
N: Total Respondents	25	50	27
% Male	28%	52%	56%
College Grades			
% > 2.5 GPA	96%	96%	100%
% > 3.0 GPA	91%	86%	88%
% > 3.5 GPA	61%	44%	48%
GRE Test Version			
Braille	-	-	67%
Cassette	4%	6%	30%
Large-Type	88%	62%	-
Regular Tye	12%	38%	19%
Conditions of Testing			
% Different Final Exam	10%	15%	18%
% Different Room (GRE)	88%	100%	96%
(College)	20%	49%	93%
% Extra Time (GRE)	76%	90%	100%
(College)	32%	65%	63%
% Reader (GRE)	4%	32%	44%
(College)	5%	40%	93%
% Recorder (GRE)	4%	26%	93%
(College)	10%	38%	92%
% Special Equipment			
(GRE)	12%	26%	30%
(College)	20%	48%	59%
Difficult Questions			
None	40%	26%	11%
Verbal Questions	4%	6%	-
Quantitative Questions	16%	8%	30%
Analtyical Questions	8%	8%	30%
Graphic Material	32%	46%	78%
Lots of Reading	36%	54%	30%
Age of Onset			
Birth	17%	29%	56%
Preschool	33%	17%	15%
Elementary School	17%	10%	-
Middle School	-	4%	-
High School	4%	13%	11%
Beyond	29%	27%	18%

Table 16a

Differences Across SAT Test Versions:
Visually Handicapped Students

	Braille	Cassette	Large Type	Regular
Variables				
N: Respondents	35	23	186	63
% Male	43%	74%	48%	49%
SAT Verbal: $\bar{X}$ (SD)	426 (140)	425 (115)	440 (114)	450 (98)
SAT Math: $\bar{X}$ (SD)	411 (112)	471 (138)	473 (133)	526 (138)
H.S. GPA: $\bar{X}$ (SD)	3.14 (0.38)	2.94 (0.72)	3.00 (0.58)	3.11 (0.57)
% in College	60%	48%	49%	58%
% > 2.5 GPA (College)	90%	85%	76%	75%
Test Versions (College)				
Braille	46%	9%	-	-
Cassette	9%	27%	-	-
Large-Type	4%	8%	22%	6%
Regular Type	50%	58%	89%	91%
Conditions of Testing				
Different final exam	14%	9%	4%	6%
Different room (SAT)	66%	96%	82%	75%
(College)	96%	64%	35%	17%
Extra time (SAT)	94%	91%	90%	95%
(College)	92%	85%	51%	35%
Reader (SAT)	6%	30%	7%	3%
(College)	96%	75%	16%	6%
Amanuensis (SAT)	71%	43%	14%	8%
(College)	92%	75%	9%	-
Special equipment (SAT)	31%	22%	5%	8%
(College)	81%	45%	27%	9%
Difficult Items				
None	14%	22%	40%	24%
Lots of reading	20%	26%	42%	67%
Reading comprehension	3%	39%	25%	46%
Vocabulary	6%	26%	4%	17%
Mathematics	37%	13%	11%	11%
Graphics	74%	26%	17%	17%
% Satisfied: SAT	94%	91%	97%	94%
Age of Onset				
Birth	51%	17%	42%	24%
Preschool	43%	13%	27%	11%
Elementary School	3%	48%	18%	40%
Middle or Jr. High	-	4%	7%	11%
High School	3%	13%	4%	14%
After High School	-	4%	1%	-

Table 16b

GRE Differences Across Test Versions: Visually Handicapped Students

	Braille	Cassette	Large Type	Regular
N: Respondents	30	7	60	23
% Male	67%	14%	33%	74%
GRE-V: $\bar{X}$ (SD)	476 (124)	516 (71)	511 (90)	460 (121)
GRE-Q: $\bar{X}$ (SD)	421 (164	506 (150)	508 (123)	460 (152)
GRE-A: $\bar{X}$ (SD)	460 (184)	456 (163)	572 (141)	491 (171)
College Grades				
% > 2.5 GPA	100%	100%	93%	100%
% > 3.0 GPA	87%	100%	81%	91%
% > 3.5 GPA	43%	57%	49%	38%
Test Versions (College)				
Braille	7%	-	-	5%
Cassette	52%	-	8%	14%
Large Type	-	17%	25%	14%
Regular Type	55%	83%	86%	76%
Conditions of Testing				
Different final exam	21%	-	13%	14%
Different room (GRE)	90%	100%	97%	87%
(College)	93%	57%	35%	55%
Extra time (GRE)	87%	86%	87%	87%
(College)	69%	71%	46%	50%
Reader (GRE)	33%	57%	15%	43%
(College)	86%	43%	23%	35%
Recorder (GRE)	87%	43%	7%	39%
(College)	89%	29%	26%	40%
Special Equipment (GRE)	37%	14%	13%	13%
(College)	62%	33%	35%	30%
Difficult Items				
None	13%	29%	32%	22%
Verbal Ability	-	29%	3%	17%
Quantitative Ability	23%	14%	10%	30%
Analytic Ability	23%	-	3%	35%
Graphic Material	70%	57%	40%	39%
Lots of Reading	37%	57%	45%	48%
% Satisfied: GRE	70%	86%	95%	83%
Age of Onset				
Birth	52%	-	27%	18%
Preschool	14%	29%	24%	9%
Elementary School	-	43%	10%	23%
Middle or Jr. High	3%	-	2%	4%
High School	14%	-	8%	5%
After High School	17%	28%	29%	41%

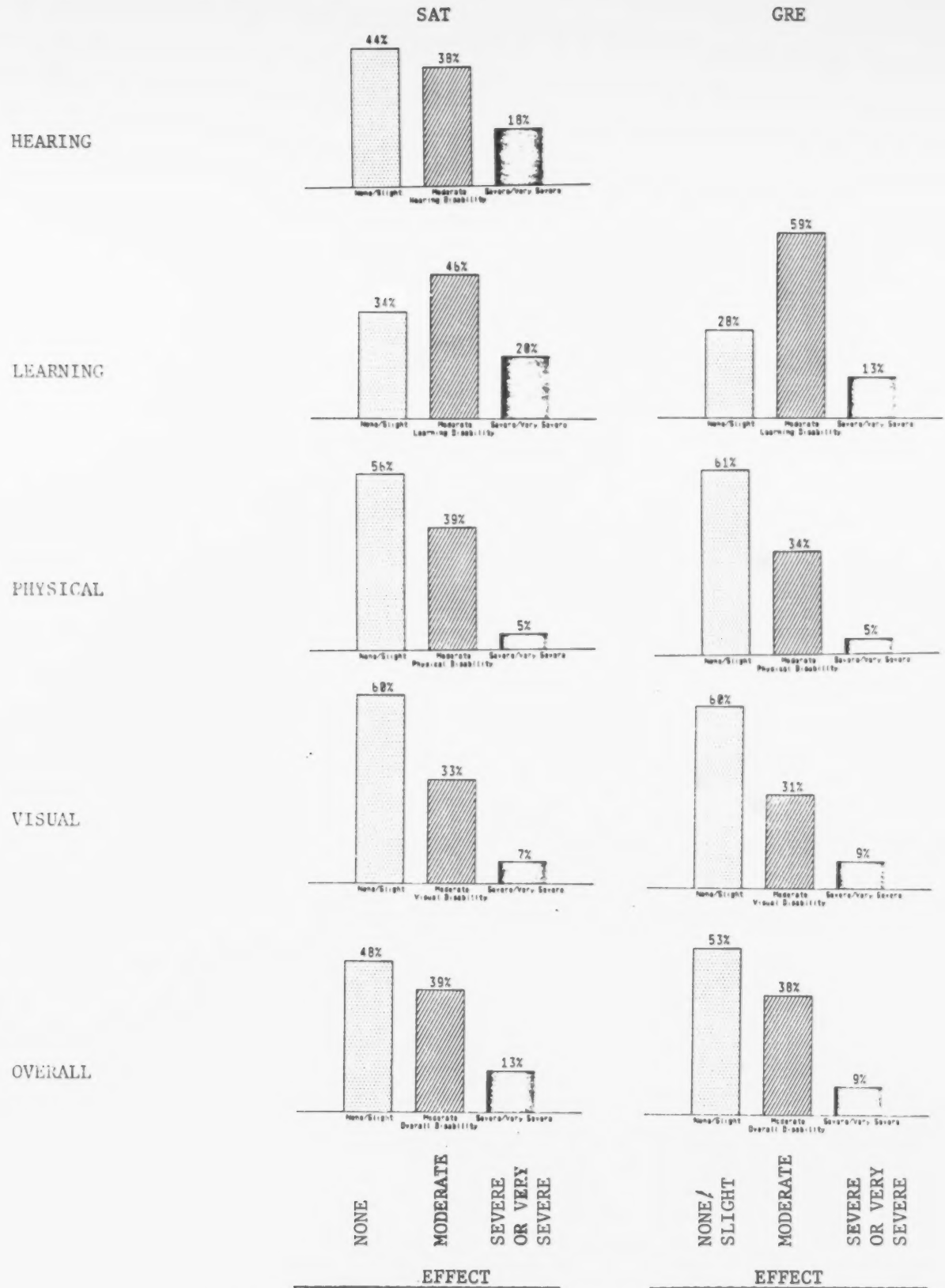


Figure 1. Effect of Disability on Academic Performance

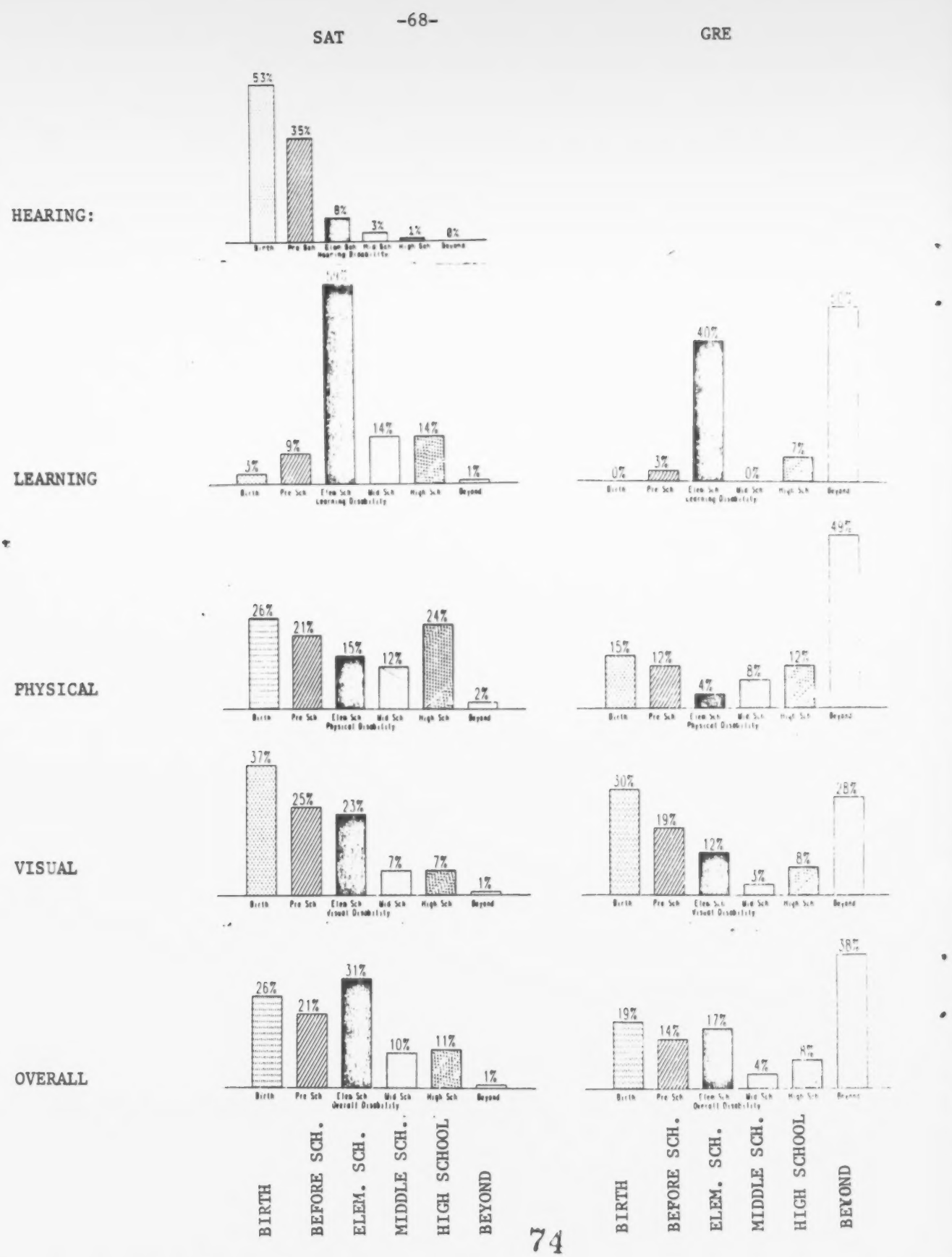
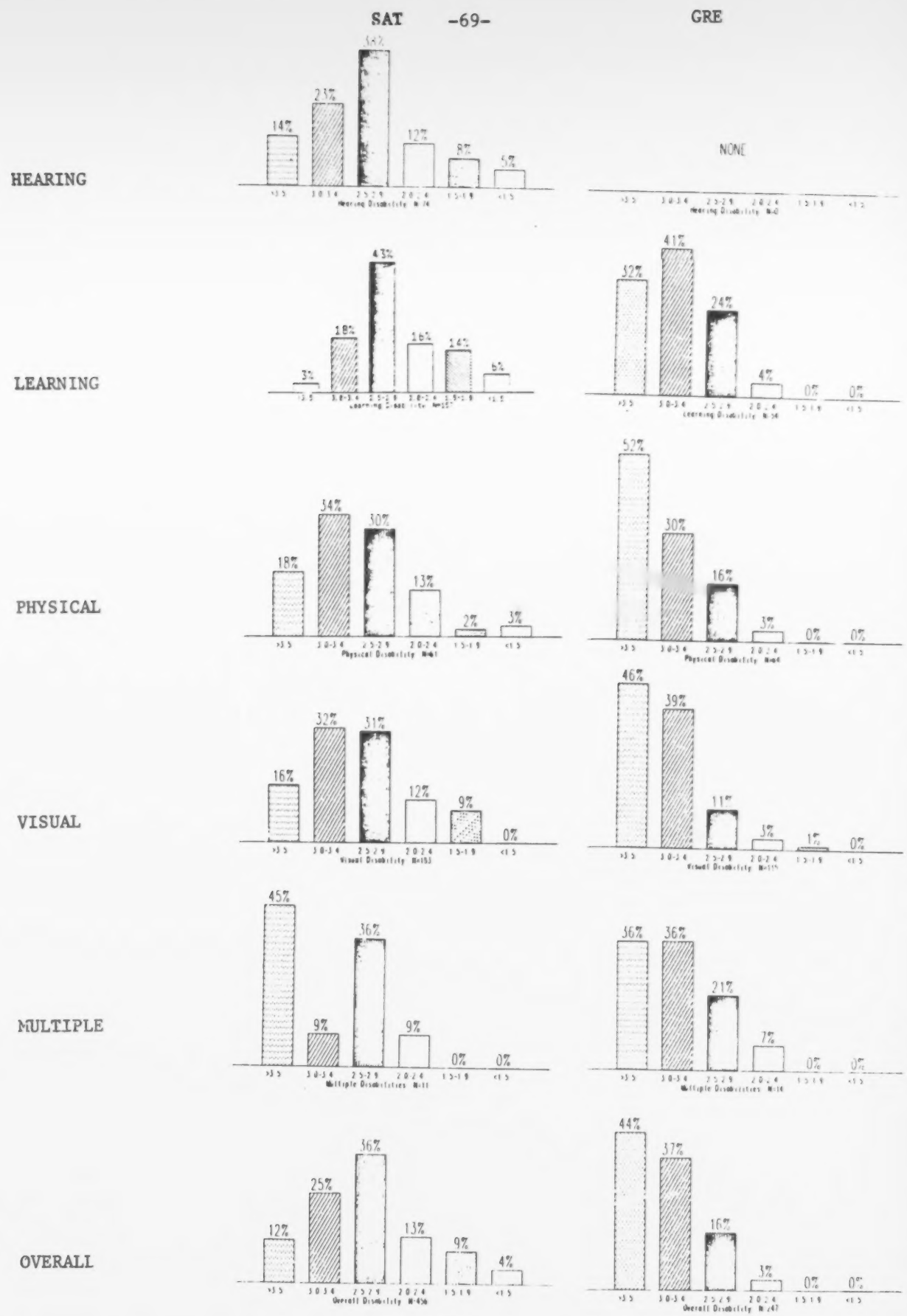


Figure 2. Age of Initial Diagnosis of Disability
SAT and GRE Respondents

Figure 3. Self-Reported Grade-Point-Averages of SAT and GRE Respondents Attending College



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Appendix A

SAT Questionnaire

GRE Questionnaire

Letter Including Disability Classification Sheet

SURVEY OF SPECIAL TEST ADMINISTRATIONS

1. LAST YEAR YOU TOOK THE SCHOLASTIC APTITUDE TEST (SAT) IN A SPECIAL TEST ADMINISTRATION. WHICH VERSION(S) OF THE SAT DID YOU USE? (PLEASE CHECK ALL THAT APPLY.)

   ☐ BRAILLE ☐ LARGE-TYPE
   ☐ CASSETTE ☐ REGULAR-TYPE

2. WHICH OF THE FOLLOWING DESCRIBE THE SPECIAL CONDITIONS UNDER WHICH YOU TOOK THE SAT? (CHECK ALL THAT APPLY.)

   ☐ SEPARATE ROOM
   ☐ EXTRA TIME
   ☐ A READER TO READ THE TEST
   ☐ AN INTERPRETER TO SIGN THE INSTRUCTIONS
   ☐ A PERSON TO RECORD THE ANSWERS
   ☐ SPECIAL EQUIPMENT (E.G., TYPEWRITER, MAGNIFIER, ETC.)
   ☐ OTHER WHAT?_____

3. OVERALL, WERE THE SPECIAL ARRANGEMENTS UNDER WHICH YOU TOOK THE SAT SATISFACTORY?

   ☐ YES
   ☐ NO IF NOT, WHY?_____

4. WHAT KINDS OF TEST QUESTIONS WERE MOST DIFFICULT FOR YOU <u>BECAUSE OF YOUR DISABILITY</u>? (CHECK ALL THAT APPLY.)

   ☐ NO QUESTIONS WERE MOST DIFFICULT BECAUSE OF MY DISABILITY
   ☐ READING COMPREHENSION QUESTIONS
   ☐ VOCABULARY QUESTIONS
   ☐ MATH QUESTIONS
   ☐ QUESTIONS WITH GRAPHIC MATERIAL
   ☐ QUESTIONS WITH A LOT OF READING
   ☐ OTHER. WHAT?_____

IN ORDER TO USE THIS INFORMATION MOST EFFECTIVELY, WE NEED TO ASK A FEW QUESTIONS ABOUT YOU AND YOUR DISABILITY.

5. HOW DO YOU CLASSIFY YOUR DISABILITY? (CHECK ALL THAT APPLY.)

- ☐ VISUAL
- ☐ PHYSICAL
- ☐ HEARING
- ☐ LEARNING
- ☐ OTHER. WHAT?_____

6. WHAT SPECIFIC DISABILITY DO YOU HAVE?

_____

_____

7. ☐ PLEASE SEE PAGE 2 OF THE ACCOMPANYING LETTER AND WRITE HERE THE NUMBER DESCRIBING YOUR DISABILITY.

8. IN YOUR OPINION, HOW DOES YOUR DISABILITY AFFECT YOUR EDUCATIONAL PERFORMANCE?

- ☐ 1. NOT AT ALL
- ☐ 2. ONLY SLIGHTLY
- ☐ 3. MODERATELY
- ☐ 4. SEVERELY
- ☐ 5. VERY SEVERELY

9. AT WHAT AGE WAS YOUR DISABILITY FIRST DIAGNOSED?

- ☐ 1. AT BIRTH
- ☐ 2. BEFORE I WENT TO SCHOOL
- ☐ 3. IN ELEMENTARY SCHOOL
- ☐ 4. IN MIDDLE SCHOOL OR JUNIOR HIGH SCHOOL
- ☐ 5. IN HIGH SCHOOL
- ☐ 6. AFTER HIGH SCHOOL

ON THIS PAGE WE WOULD LIKE TO KNOW ABOUT YOUR EXPERIENCES WITH REGARD TO COLLEGE.

10. DID YOU ATTEND COLLEGE THIS YEAR?

☐ YES ☐ NO (PLEASE SKIP TO NEXT PAGE)

11. WHAT COLLEGE DID YOU ATTEND?_____

(CITY & STATE)_____

12. IS IT A 4-YEAR OR A 2-YEAR COLLEGE?

☐ 4-YEAR ☐ 2-YEAR

13. APPROXIMATELY WHAT IS YOUR CURRENT GRADE POINT AVERAGE AT COLLEGE ON A SCALE OF 0(F) TO 4(A). (CHECK ONE.)

☐ (A) 3.5 OR ABOVE
☐ (B) 3.0-3.4
☐ (C) 2.5-2.9
☐ (D) 2.0-2.4
☐ (E) 1.5-1.9
☐ (F) BELOW 1.5

14. HOW OFTEN DID YOU TAKE YOUR FINAL EXAMINATIONS UNDER THE FOLLOWING SPECIAL CONDITIONS? (PLEASE CHECK ONE OPTION FOR EACH LINE.)

NEVER	SOMETIMES	OFTEN	
☐	☐	☐	I TOOK A DIFFERENT FINAL EXAM
☐	☐	☐	I TOOK A BRAILLE EXAM
☐	☐	☐	I TOOK A CASSETTE EXAM
☐	☐	☐	I TOOK A LARGE-TYPE EXAM
☐	☐	☐	I TOOK A REGULAR-TYPE EXAM
☐	☐	☐	I WAS IN A DIFFERENT ROOM
☐	☐	☐	I HAD EXTRA TIME
☐	☐	☐	I HAD A READER
☐	☐	☐	I HAD AN INTERPRETER
☐	☐	☐	I HAD A PERSON RECORD MY ANSWERS
☐	☐	☐	I USED SPECIAL EQUIPMENT
☐	☐	☐	OTHER. WHAT?_____

WE WOULD LIKE TO KNOW IF INFORMATION ABOUT SPECIAL TESTING ACCOMMODATIONS FOR THE SAT IS REACHING THE PEOPLE WHO SHOULD KNOW ABOUT THEM.

15. AT THE TIME YOU FIRST TOOK THE SAT, WERE YOU AWARE OF THE SPECIAL ACCOMMODATIONS AVAILABLE TO CANDIDATES WITH DISABILITIES?

☐ YES ☐ NO

16. FROM WHOM DID YOU LEARN ABOUT SPECIAL ACCOMMODATIONS FOR THE SAT? (CHECK ALL THAT APPLY.)

☐ HIGH SCHOOL GUIDANCE COUNSELOR
☐ SPECIAL EDUCATION TEACHER
☐ A FELLOW STUDENT
☐ AN AGENCY FOR THE HANDICAPPED
☐ A COLLEGE COUNSELOR
☐ EDUCATIONAL TESTING SERVICE
☐ OTHER. WHO?_____

IF YOU ARE WILLING TO HELP US FURTHER IN OUR RESEARCH WE WOULD LIKE TO KNOW:

17 ☐ I AM WILLING TO BE CONTACTED ABOUT MY FIRST YEAR GRADE-POINT AVERAGE

18. ☐ I AM WILLING TO BE CONTACTED ABOUT SPECIFIC PROBLEMS WITH TEST QUESTIONS

19. MY TELEPHONE NUMBER IS (_____) _____ - _____ (OPTIONAL)

20. IF YOUR ADDRESS IS INCORRECT, PLEASE WRITE THE CORRECT ADDRESS BELOW.

THANK YOU THANK YOU THANK YOU

SURVEY OF SPECIAL TEST ADMINISTRATIONS

1. Recently you took the Graduate Record Examination (GRE) in a special test administration. Which version(s) of the GRE did you use? (Please check all that apply.)

___ Braille ___ Large-Type

___ Cassette ___ Regular-Type

2. Which of the following describe the special conditions under which you took the GRE? (Check all that apply.)

___ Separate room

___ Extra time

___ A reader to read the test

___ An interpreter to sign the instructions

___ A person to record the answers

___ Special equipment (e.g., typewriter, magnifier, etc.)

___ Other What? _____

3. Overall, were the special arrangements under which you took the GRE satisfactory?

___ Yes

___ No If not, why? _____

4. What kinds of test questions were most difficult for you <u>because of your disability?</u> (Check all that apply.)

___ No questions were most difficult because of my disability

___ Questions testing verbal ability

___ Questions testing quantitative ability

___ Questions testing analytic ability

___ Questions with graphic material

___ Questions with a lot of reading

___ Other. What? _____

IN ORDER TO USE THIS INFORMATION MOST EFFECTIVELY, WE NEED TO ASK A FEW QUESTIONS ABOUT YOU AND YOUR DISABILITY.

5. How do you classify your disability? (Check all that apply.)

___ Visual

___ Physical

___ Hearing

___ Learning

___ Other. What? _____

6. What specific disability do you have?

_____

_____

7. [ ] Please see Page 2 of the accompanying letter and write here the number describing your disability.

8. In your opinion, how does your disability affect your educational performance?

___ 1. Not at all

___ 2. Only slightly

___ 3. Moderately

___ 4. Severely

___ 5. Very severely

9. At what age was your disability first diagnosed?

___ 1. At birth

___ 2. Before I went to school

___ 3. In elementary school

___ 4. In middle school or junior high school

___ 5. In high school

___ 6. After high school

ON THIS PAGE WE INQUIRE ABOUT YOUR EXPERIENCE IN COLLEGE.

10. DID YOU TAKE THE SAT FOR ADMISSION TO COLLEGE?

___ YES WHEN? 19__ SCORES? V ____ Q ____

___ NO

11. DID YOU ATTEND COLLEGE THIS YEAR?

___ YES WHAT COLLEGE? _____

___ NO

12. APPROXIMATELY WHAT IS YOUR CURRENT GRADE POINT AVERAGE AT COLLEGE ON A SCALE OF 0(F) TO 4(A). (CHECK ONE.)

___ (A) 3.5 OR ABOVE ___ (D) 2.0-2.4

___ (B) 3.0-3.4 ___ (E) 1.5-1.9

___ (C) 2.5-2.9 ___ (F) BELOW 1.5

13. HOW OFTEN IN COLLEGE DID YOU TAKE YOUR FINAL EXAMINATIONS UNDER THE FOLLOWING SPECIAL CONDITIONS? (PLEASE CHECK ONE OPTION FOR EACH LINE).

NEVER	SOMETIMES	OFTEN	
___	___	___	I TOOK A DIFFERENT FINAL EXAM
___	___	___	I TOOK A BRAILLE EXAM
___	___	___	I TOOK A CASSETTE EXAM
___	___	___	I TOOK A LARGE-TYPE EXAM
___	___	___	I TOOK A REGULAR-TYPE EXAM
___	___	___	I WAS IN A DIFFERENT ROOM
___	___	___	I HAD EXTRA TIME
___	___	___	I HAD A READER
___	___	___	I HAD AN INTERPRETER
___	___	___	I HAD A PERSON RECORD MY ANSWERS
___	___	___	I USED SPECIAL EQUIPMENT
___	___	___	OTHER. WHAT? _____

WE WOULD LIKE TO KNOW IF INFORMATION ABOUT SPECIAL TESTING ACCOMMODATIONS FOR THE GRE IS REACHING THE PEOPLE WHO SHOULD KNOW ABOUT THEM.

14. AT THE TIME YOU FIRST TOOK THE GRE, WERE YOU AWARE OF THE SPECIAL ACCOMMODATIONS AVAILABLE TO CANDIDATES WITH DISABILITIES?

___ YES ___ NO

15. FROM WHOM DID YOU LEARN ABOUT SPECIAL ACCOMMODATIONS FOR THE GRE (CHECK ALL THAT APPLY.)

___ A COUNSELOR AT COLLEGE

___ SPECIAL SERVICES PERSONNEL AT COLLEGE

___ A FELLOW STUDENT

___ AN AGENCY FOR THE HANDICAPPED

___ THE GRADUATE SCHOOL

___ EDUCATIONAL TESTING SERVICE: THE GRE INFORMATION BULLETIN

___ OTHER. WHO? _____

IF YOU ARE WILLING TO HELP US FURTHER IN OUR RESEARCH, WE WOULD LIKE TO KNOW:

16. ___ I AM WILLING TO BE CONTACTED ABOUT MY FIRST YEAR GRADE-POINT AVERAGE IN GRADUATE SCHOOL.

17. ___ I AM WILLING TO BE CONTACTED ABOUT SPECIFIC PROBLEMS WITH TEST QUESTIONS.

18. MY TELEPHONE NUMBER IS ( ) - (OPTIONAL)

19. IF YOUR ADDRESS IS INCORRECT, PLEASE WRITE THE CORRECT ADDRESS BELOW.

THANK YOU THANK YOU THANK YOU

April, 1984

Hello

Educational Testing Service, the College Board and the Graduate Record Examination Board are conducting studies of admissions tests for students with disabilities. We need your help with this task. Comparatively speaking, handicapped students who go to college are a rare breed. We need every bit of information we can get to accomplish our purpose.

What is our purpose? We want a sound base of information about handicapped test takers and their disabilities in order to improve our services. We want to evaluate, and enhance whenever possible, the fairness and comparability of our tests and their predictive validity for students with disabilities. We want to make sure that qualified handicapped students are not penalized by inappropriate test questions or testing situations.

How can you help? Please answer the questions on the enclosed questionnaire. We have tried to keep the number of questions to a minimum to make it easier for you to respond. Please try to answer every question; there is an important purpose for each one. Return the questionnaire to us in the enclosed envelope. Your help will improve future admissions testing for candidates with disabilities.

If you have any questions about the study or have difficulty completing the questionnaire, please call me. My phone number is (609) 921-9000, Extension 5702. Thank you for your assistance in this important endeavor.

Sincerely,

Marjorie Ragosta
Senior Research Scientist
Educational Testing Service
Princeton, New Jersey 08541

PLEASE USE THE INFORMATION ON THIS PAGE TO COMPLETE QUESTION 7 OF THE QUESTIONNAIRE. WRITE THE NUMBER WHICH BEST MATCHES YOUR DISABILITY IN THE SPACE PROVIDED IN QUESTION 7.

VISUAL DISABILITY

10 I AM NOT LEGALLY BLIND.
11 I AM LEGALLY BUT NOT TOTALLY BLIND.
12 I AM TOTALLY BLIND.

PHYSICAL DISABILITY

13 PARAPLEGIA
14 QUADRIPLEGIA
15 POST POLIO
16 SPINA BIFIDA
17 CEREBRAL PALSY
18 MUSCULAR DYSTROPHY
19 MULTIPLE SCLEROSIS
20 MISSING LIMBS
21 CANCER
22 DIABETES
23 EPILEPSY
24 EMPHYSEMA
25 HEART DISEASE
26 SPEECH IMPAIRMENT
27 PSYCHOLOGICAL PROBLEMS
28 MULTIPLE HANDICAPS
29 OTHER (NOT LISTED)

HEARING DISABILITY

30 I AM MOST FLUENT IN ENGLISH.
31 I AM MOST FLUENT IN ASL OR MANUAL COMMUNICATION.
32. I AM EQUALLY FLUENT IN BOTH ENGLISH AND MANUAL COMMUNICATION.

LEARNING DISABILITY

33 I HAVE MOST DIFFICULTY WITH READING.
34 I HAVE MOST DIFFICULTY WITH WRITING.
35 I HAVE EQUAL DIFFICULTY WITH READING AND WRITING.
36 I HAVE MOST DIFFICULTY WITH MATHEMATICS.

Appendix B

Annotated Bibliography of Previous Reports of the

"Studies of Admissions Testing and Handicapped People"

The following previous reports from "Studies of Admissions Testing and Handicapped People" are available upon request from Educational Testing Service, Research Publications Unit-Room T143, Princeton NJ 08541:

#1 Bennett, R., and Ragosta, M. A Research Context for Studying Admissions Tests and Handicapped Populations, 1984. (ETS Research Report 84-31)

This is the first of a series of reports emanating from a four year research effort to further knowledge of admissions testing and handicapped people. The authors describe the legal and educational issues that gave rise to this research and the major questions to be addressed. They discuss the distinguishing characteristics of different types of disability and the complex definitional problems that hamper any simple method of classifying examinees by type of handicap.

#2 Bennett, R., Ragosta, M., and Stricker, L. The Test Performance of Handicapped People, 1984 (ETS Research Report 84-32)

The purpose of this report was to summarize existing research information concerning the performance of handicapped people on admissions and other similar tests. As a group, handicapped examinees scored lower than did the nonhandicapped. Among the four major groups examined, physically handicapped and visually impaired examinees were most similar to the nondisabled population. Hearing disabled students performed least well. Available studies of the SAT and ACT generally supported the validity of those tests for handicapped people, but it was confirmed that research to date has been quite limited and has not addressed many important questions.

#3 Bennett, R., Rock, D., and Kaplan, B. The Psychometric Characteristics of the SAT for Nine Handicapped Groups, 1985. (ETS Research Report 85-49)

In this study the main finding was that with the exception of performance level, the characteristics of the Scholastic Aptitude Test (SAT) were generally comparable for handicapped and nonhandicapped students. The analyses focused on level of test performance, test reliability, speededness, and extent of unexpected differential item performance on the SAT. Visually impaired students and those with physical handicaps achieved mean scores similar to those of students taking the SAT in national administrations, while learning disabled and hearing impaired students scored lower than their nondisabled peers. Analysis of individual items revealed only a few instances of differential item performance localized to visually imparied students taking the Braille test.

#4 Rock, D., Bennett, R., and Kaplan, B. The Internal Construct Validity of the SAT Across Handicapped and Nonhandicapped Populations, 1985. (ETS Research Report 85-50)

This study further investigated the comparability of SAT Verbal and Mathematical scores for handicapped and nonhandicapped populations. A two-factor model based on Verbal and Mathematical item parcels was posed and tested for invariance across populations. This model provided a reasonable fit in all groups, with the mathematical reasoning factor generally showing a better fit than the verbal factor. Compared with the nonhandicapped population, these factors tended to be less correlated in most of the handicapped groups. This greater specificity implies the increased likelihood of achievement growth in one area independent of the other and suggests that SAT Verbal and Mathematical scores be interpreted separately rather than as an SAT composite. Finally, there was evidence that the Mathematical scores for learning disabled students taking the cassette test may underestimate the reasoning ability of this group.